



**VIRGINIA
IS FOR
LEARNERS**

**DIABETES
MANAGEMENT IN
SCHOOLS:
MANUAL FOR UNLICENSED
PERSONNEL**

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Traci Carter
Instructor of Pediatrics
Uniformed Services University of the Health Sciences
Diabetes Nurse Educator
The Children's Center at Walter Reed National Military Medical Center

Renee Freeman, RN, BSN, CDE, CDT
Nurse Manager
Children's Hospital of the Kings Daughter

Robin L. Hills, RN, DNP, WHNP-BC
Deputy Executive Director for Education Programs
Virginia Board of Nursing

Patricia Knox MN, BSN, RN, NCSN
Nurse Supervisor
Bedford County Public Schools

Joanna Pitts, BSN, RN, NCSN
School Health Nurse Consultant
Virginia Department of Health

Edited by:

Nancy Roy-Griggs, BSN, RN, ADCES
National Certified Diabetes Educator
School Nurse Consultant

Tracy White, MA, BSN, RN
School Health Specialist
Virginia Department of Education

Diane Allen, MSN, RN, NCSN
School Nurse Specialist
Virginia Department of Education

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INTRODUCTION

Diabetes is the third most common chronic health disease of childhood according to [The Search for Diabetes in Youth \(SEARCH\) Study](#) (Hamman, Richard, et. al. SEARCH, 2014). There are more than 190,000 children under the age of 20 with diabetes. According to recent estimates, about 17,900 youths under the age of 20 are diagnosed with Type 1 diabetes, and 5,300 youths ages ten to nineteen are diagnosed with Type 2 diabetes. (Helping the Student with Diabetes Succeed: A Guide for School Personnel, 2020).

“The majority of young people with diabetes spend many hours at school and/or in some type of childcare program. Trained and knowledgeable staff are essential to provide a safe school and childcare environment for children with diabetes. This includes the provision of care during the school day, field trips, and all school-sponsored activities in the school setting and in preschool, daycare, and camp programs in the childcare setting. Staff play a critical role in helping to reduce the risk of short-and long-term complications of diabetes and ensuring that children are well-positioned for academic success and normal growth and development” (Diabetes Care in the School Setting: A Position Statement of the American Diabetes Association, 2015).

According to the National Diabetes Education Program, “the school nurse, who provides care to students with diabetes and facilitates diabetes management training for school personnel, has the professional responsibility to acquire and maintain current knowledge and competency related to diabetes management on a regular and ongoing basis.” (Helping the Student, 2020).

VIRGINIA LEGISLATION

The *Code of Virginia* provides guidance to schools regarding the care of students with diabetes in the school setting. [Appendix C](#) contains references that outline some of the critical provisions in the *Code of Virginia*, including excerpts or descriptions pertinent to these matters. Specific *Code* references may also be accessed online, utilizing the Virginia General Assembly [Legislative Information System](#).

PURPOSE

The purpose of this manual is to provide the registered nurse (RN) or licensed physician with the tools to equip unlicensed school personnel to confidently, and safely provide care to the student with diabetes in the absence of professional healthcare providers in the school. This manual provides a blueprint of information that must be included in training programs for school staff. Included are resources for further information, sample documents, basic information regarding diabetes and its management, a glossary, guidance in selecting appropriate training personnel and setting up the training session, and diabetes resources for school nurses, teachers, and parents.

The overarching goal of the training program is to provide schools with the means to ensure that their students with diabetes are medically safe at school and have the best opportunity to learn and to fully participate in the whole school experience.

TRAINING PARAMETERS

The approved guidelines provide a framework for local school divisions to implement, ensure local school divisions are adequately prepared to administer insulin and glucagon, and to provide continuity in training school personnel.

The school nurse has multiple functions in the care of the student with diabetes. *“The school nurse develops an individualized healthcare plan in partnership with the student and his or her family, based on the medical orders in the Diabetes Medical Management Plan (DMMP) and the nurse’s assessment.”* (National Association of School Nurses Diabetes Management in the School Setting, 2017).

The role of the school nurse includes:

- case management;
- direct care;
- development of the Individualized Health Care Plan (IHP);
- creation of written Emergency Action Plans (EAP) for hypoglycemia and hyperglycemia for unlicensed school personnel;
- training and supervision of unlicensed assistive personnel in implementing all daily care outlined in the IHP, as well as administering insulin and/or glucagon; and
- evaluation of care provided to the student.

Training shall be documented and shall include the instructor’s name, trainee’s name, date of training, a skills checklist, and documentation of competency of the trainee to administer insulin and/or glucagon. Samples of forms for training skills checklists and other appropriate documentation are included in this [Diabetes Training Resources](#) section of this document.

QUALIFICATIONS OF INSTRUCTIONAL PERSONNEL

The trainer must be:

- A registered nurse (RN), licensed physician, or certified diabetes educator with experience within the past two years in the management of diabetes in children and adolescents.
- Trained in relevant sections of federal and state laws and regulations, such as: *Individuals with Disabilities Education Act (IDEA)*; *Rehabilitation Act of 1973, Section 504*; and *Occupational Safety and Health Act (OSHA)*.

The initial training course shall continue until competency is demonstrated, but shall not be less than four hours. Skills shall be maintained with an annual training session lasting no less than one hour or until competency is demonstrated.

TRAINING CURRICULUM

The content of the training curriculum has been organized into 13 modules and is designated for unlicensed school personnel. Each module contains required *Code of Virginia* training components as outlined by the Boards of Education, Nursing, and Medicine in 1999, 2011, and 2015. For details of training requirements, refer to [Appendix A](#) of this document. Diabetes technology, therapies, and evidence-based practices are changing rapidly. The scope of the training material has expanded to reflect current practice.

MODULE A: RIGHTS AND RESPONSIBILITIES

FEDERAL LAWS REGARDING CARE FOR STUDENTS WITH DIABETES

In Module A participants will learn about federal and state legislation related to the care of students with diabetes including: the *Family Educational Rights and Privacy Act (FERPA)*; *Health Insurance Portability and Privacy Act (HIPAA)*; Occupational Safety and Health Administration (OSHA) requirements for safe practice; qualifications of trainer and levels of training needed to administer medication; and the responsibilities of these trained individuals to collaborate with and/or report concerns or questions to supervisory staff.

Federal laws that protect the rights of children with diabetes include *The Individual with Disabilities Act (IDEA)*, *The American with Disabilities Act*, and *Section 504 of The Rehabilitation Act of 1973*. Under Section 504 and the *American with Disabilities Act*, diabetes is considered a disability. It is illegal for schools to discriminate against students with disabilities, including diabetes. Any school that receives federal funding must reasonably accommodate the special needs of students with diabetes. The required accommodations should be documented in a written plan developed under the applicable federal law such as Section 504 or Individualized Education Program (IEP) (*ADA Diabetes Care in the School Setting*, 2015).

The [*Health Insurance Portability and Accountability Act \(HIPAA\)*](#) and the [*Family Educational Rights and Privacy Act \(FERPA\)*](#) applies to educational agencies and institutions that receive funds under any program administered by the U.S. Department of Education. This includes virtually all public schools and school districts. At the elementary or secondary level, a student's health records, including immunization records, maintained by an educational agency or institution subject to *FERPA*, as well as records maintained by a school nurse, are "education records" subject to the privacy requirements of *FERPA*. In addition, records that schools maintain on special education students, including records on services provided to students under *IDEA*, are "education records" under *FERPA*. This is because these records are (1) directly-related to a student, (2) maintained by the school or a party acting for the school, and (3) not excluded from the definition of "education records." A breach of confidentiality by school personnel can result in disciplinary action or dismissal by the school division as well as potential legal implications against the individual who violated *FERPA* or *Health Insurance Portability and Accountability Act (HIPAA)* (*Family Educational Rights and Privacy Act (FERPA)*, 2020, Summary of the HIPAA Privacy Rule OCR 2013).

The *HIPAA* privacy rule requires *Code of Virginia* covered entities to protect individuals' health records and other identifiable health information by requiring appropriate safeguards to protect privacy and setting limits and conditions on the uses and disclosures that may be made of such information without patient authorization. The rule also gives patients' rights over their health information, including rights to examine and obtain a copy of their health records, and to request corrections. Most adults are familiar with the application of this privacy law in their

own health-related care. Prescriber orders for medication administration in the school setting may be clarified for the school nurse, but additional health information about the student may not be provided without the consent of the parent or legal guardian. School staff must protect student privacy about all health information.

The [Occupational Safety and Health Administration](#) (OSHA) blood borne pathogens was issued in December 1991 to reduce the occupational transmission of infections caused by microorganisms sometimes found in human blood and certain other potentially infectious materials. Following OSHA requirements, an Exposure Plan provides specific guidance on the management of sharps and other items contaminated with blood and body fluids (OSHA Bloodborne Pathogens, 2013).

OSHA makes the following requirements:

Sharps:

- Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed.
- Shearing or breaking of contaminated needles is prohibited.
- Used sharps containers must be closable, puncture resistant, labeled, or colored-coded, leak proof on sides and bottom, kept secure, and remain upright throughout use. Sharps containers must be easily accessible to personnel and located as close as possible to the immediate area where sharps are used.

Personal protective equipment:

- Disposable gloves (non-latex or vinyl) shall be worn when performing a procedure where there is a reasonable expectation that the employee may have contact with blood or other potentially infectious material. Single use gloves are replaced as soon as practicable after coming in contact with blood or infectious material or, as soon as possible, if torn or the ability to act as a barrier is compromised.

VIRGINIA LAWS REGARDING CARE OF STUDENTS WITH DIABETES

The Virginia Nurse Practice Act

The Department of Health Professions regulates the practice of nursing in the Commonwealth. The *Virginia Nurse Practice Act* exists to regulate and protect the public from practitioners who are a risk to the health, safety, and welfare of the citizens within its state board jurisdiction. This protection principle is accomplished by assessing competence at initial licensure and throughout the career of the nurse. The *Code of Virginia* § [54.1-3000](#) states that a “professional nurse” is a registered nurse whose practice is defined as follows:

“Professional nursing,” “registered nursing” or “registered professional nursing” means the performance for compensation of any nursing acts in the observation, care and counsel of individuals or groups who are ill, injured or experiencing changes in normal health processes or the maintenance of health; in the prevention of illness or disease; in the supervision and teaching of those who are or will be involved in nursing

care; in the delegation of selected nursing tasks and procedures to appropriately trained unlicensed persons as determined by the Board; or in the administration of medications and treatments as prescribed by any person authorized by law to prescribe such medications and treatment. Professional nursing, registered nursing and registered professional nursing require specialized education, judgment, and skill based upon knowledge and application of principles from the biological, physical, social, behavioral and nursing sciences.”

Legislative Guidance for Schools

The Code of Virginia § [22.1-274](#) includes provisions for school health services and requires that schools provide trained staff for the care of students with diabetes.

“E. Each school board shall ensure that in school buildings with an instructional and administrative staff of ten or more (i) at least three employees have current certification or training in emergency first aid, cardiopulmonary resuscitation, and the use of an automated external defibrillator and (ii) if one or more students diagnosed as having diabetes attend such school, at least two employees have been trained in the administration of insulin and glucagon. In school buildings with an instructional and administrative staff of fewer than ten, school boards shall ensure that (a) at least two employees have current certification or training in emergency first aid, cardiopulmonary resuscitation, and the use of an automated external defibrillator and (b) if one or more students diagnosed as having diabetes attend such school, at least one employee has been trained in the administration of insulin and glucagon. "Employee" includes any person employed by a local health department who is assigned to the public school pursuant to an agreement between the local health department and the school board. When a registered nurse, nurse practitioner, physician, or physician assistant is present, no employee who is not a registered nurse, nurse practitioner, physician, or physician assistant shall assist with the administration of insulin or administer glucagon. Prescriber authorization and parental consent shall be obtained for any employee who is not a registered nurse, nurse practitioner, physician, or physician assistant to assist with the administration of insulin and administer glucagon.”

RECOMMENDED QUALIFICATIONS FOR THE UNLICENSED ASSISTIVE PERSONNEL (UAP)

According to the American Diabetes Association (ADA), “the school nurse should be the key coordinator and provider of care. The school nurse and/or other qualified healthcare professional should work with the school principal/administrator to identify school personnel who are willing and volunteer to be trained to provide care.” (Diabetes Care in the School Setting, 2015).

The National Association of School Nurses (NASN) recognizes several qualifications that should be taken into consideration when assigning personnel to be trained to

assist students with diabetes. These are listed in four categories: education, personal attributes, interpersonal attributes, and emergency effectiveness. Examples of some of these qualifications include office management skills, understands and follows school policies and guidelines, able to establish rapport with students and families, and stays calm when the unexpected occurs. (NASN: Diabetes Management School Setting, 2017). For a complete listing, refer to [Appendix E](#) of this document.

Levels of Training

In Virginia, the *Code of Virginia* sets requirements for the minimum number of staff to receive training when a student with diabetes attends school. In addition, the National Diabetes Education Program (Helping the Student, 2020) has the following training recommendations to ensure effective diabetes management in the school setting:

Level 1: All school personnel should receive training that provides:

- An overview of diabetes;
- How to recognize and respond to hypoglycemia and hyperglycemia; and
- Whom to contact for help in an emergency.

Level 2: For school personnel who have responsibility for the student with diabetes throughout the school day and school-sponsored activities should receive training that provides:

- Content from Level 1 with specific instructions for what to do in case of an emergency;
- Roles and responsibilities of individual staff members;
- Expanded overview of diabetes (types of diabetes, role of blood glucose monitoring, and the importance of balancing insulin/medication with physical activity and nutrition and how it is done);
- Procedures and brief overview of the operation of devices (or equipment) commonly used by students with diabetes;
- Impact of hypoglycemia or hyperglycemia on behavior, learning, and other activities;
- The student's Individualized HealthCare Plan, Section 504 Plan, other education plan, or Individualized Education Program (IEP);
- The student's Emergency Action Plans (EAP) for Hypoglycemia and Hyperglycemia;
- How to activate Emergency Medical Services in case of a diabetes emergency;
- What to do during a school-wide emergency (e.g., lockdown or evacuation);
- Tips and planning needed for the classroom and for special events; and
- Overview of the legal rights of students with diabetes in the school setting.

Level 3: School personnel designated as trained diabetes personnel who will be providing care for the student with diabetes in the absence of the school nurse. Level 3 training should be provided by a diabetes-trained healthcare professional such as the school nurse or certified diabetes educator. The training should include:

- All information from Level 1 and Level 2 training; and

- General training on diabetes care tasks specified in the student’s DMMP to include:
 - blood glucose monitoring;
 - insulin administration;
 - glucagon administration;
 - ketone testing (urine and blood); and
 - carbohydrate counting.

Student-specific training, when addressing each diabetes care task, includes:

- Clear identification and understanding of the task as outlined in the student’s DMMP;
- Each student’s symptoms and treatment for hypoglycemia and hyperglycemia;
- Step-by-step instructions on how to perform the task using the student’s equipment and supplies;
- Clear parameters on when to perform the task, when not to do so, and when to ask for help from a healthcare professional;
- How to document that all care tasks are performed; and
- Plan for ongoing evaluation of trained diabetes personnel’s performance.

RESPONSIBILITIES FOR COLLABORATION

Collaboration and cooperation are key elements in planning and implementing successful diabetes management at school. As is true for students with other chronic diseases, students with diabetes are more likely to succeed at school when the student’s school healthcare team work together.

Members of the student’s personal diabetes health care team may include:

- student with diabetes;
- parents/guardians;
- doctor;
- nurse;
- registered dietitian nutritionist;
- diabetes educator; and
- other healthcare providers.

MODULE B: OVERVIEW OF DIABETES

Module B provides a broad overview of how the human body processes the intake of glucose into the body, the role that insulin plays, and the management of this delicate balance within the school setting.

The National Diabetes Education Program (NDEP) defines diabetes as “a chronic disease in which blood glucose (sugar) levels are above normal” (Helping the Student, 2020). When people eat, much of the food is broken down into glucose, a form of sugar in the blood. Glucose is the main source of energy for the body. As digestion occurs, the glucose moves into the blood, which transports it to the cells of the body where it is used for energy.

There must be insulin present to move the glucose into the cells of the body from the blood. Insulin is a hormone made by the pancreas and usually secreted in response to increased blood glucose levels. In people who have diabetes, the body makes little or no insulin or the body does not use insulin properly. Because the body is not using the glucose, high levels of glucose build up in the blood, spill into the urine, and then are passed out of the body. Even though the body has high levels of glucose in the blood, the body lacks the ability to utilize it, and the body’s main source of fuel is lost.

If the body no longer makes insulin, an alternate source of insulin must be provided either by injections or from an insulin pump. If the body does not use insulin properly, individuals may take insulin and/or other glucose lowering medications. Insulin and other diabetes medications are used to manage blood glucose levels; they do not provide a cure for the disease.

“Managing blood glucose is a constant juggling act 24-hours a day, seven days a week. It is a constant quest to achieve the right balance between food intake, physical activity, and insulin amounts in order to keep blood sugar levels in the target range. Factors such as exercise, illness, and stress, make it difficult to always maintain that perfect balance. When the balance is tipped, the student experiences symptoms of blood sugars that are too high or too low. Blood sugars that are too high or too low are serious and require proper recognition and action by trained adults to help keep students healthy. Some students may handle all or most of their routine care by themselves. Others will need help from school personnel. All students with diabetes will need help during an emergency, which may happen at any time.” (Helping the Student, 2020).

The American Diabetes Association’s (ADA) Position Statement, Standards of Medical Care, (2019) provides a summary of diabetes management tools and goals, including blood glucose levels, suitable for use by most individuals. It is important to remember that the medical management of diabetes should be individualized to the needs of the person. Healthcare providers target ranges of blood glucose taking into account the benefits, risks, the frequency of low blood glucose, and the individual’s ability to

recognize when they have a low blood glucose. A-1c is a lab value that measures the amount of hemoglobin in the blood that has glucose attached to it. Hemoglobin is a protein found inside red blood cells that carries oxygen to the body. The ADA recommends a target A-1C level of <7.5 percent for all pediatric groups; however, individualization is still encouraged (ADA Standards, 2019).

“Taking care of diabetes is important. Over the years, ongoing high blood glucose can lead to serious health problems. If not managed effectively, diabetes can affect the blood vessels, eyes, kidneys, nerves, gums, and teeth, making it the leading cause of adult blindness, kidney failure, and non-traumatic lower limb amputations. Poorly controlled diabetes also increases a person’s risk for heart disease and stroke”
(Helping the Student, 2020).

Studies have proven that with intensive treatment that keeps the blood glucose levels near normal, many of these complications can be prevented or delayed.

The management of diabetes is rapidly changing. Technological advances provide more options for individualized care. Diabetes management requires an individual approach. It requires a careful balance of a variety of factors including the student’s age and developmental level. Additional factors to consider include exercise and sports, diet, medication management, and blood glucose monitoring. It is necessary to consider all these factors when preparing the student’s individualized healthcare plan and in planning for the least restrictive educational environment.

TYPE 1 DIABETES MELLITUS

Type 1 Diabetes Mellitus (T1DM) is a complex metabolic disease. In people with T1DM, the immune system attacks the beta cells (insulin-producing cells of the pancreas) and destroys them. Because the pancreas can no longer produce insulin, people with T1DM need to take insulin and/or oral medications on a daily basis to live. T1DM can occur at any age, but it begins most often in children and young adults. Currently, there is no cure for T1DM, but research into prevention and treatment is ongoing.

Signs/Symptoms include:

- increased thirst;
- increased urination;
- constant hunger;
- weight loss;
- blurred vision; and
- fatigue.

Risk Factors include:

- genetics; and
- environment.

TYPE 2 DIABETES MELLITUS

Type 2 Diabetes Mellitus (T2DM) is the most common form of diabetes found in adults, but as more children and adolescents in the United States have become overweight and inactive, T2DM is occurring in young people. A progressive disease, T2DM usually begins with insulin resistance, a condition in which cells do not use the insulin properly. Over time, the pancreas loses its ability to secrete insulin in response to meals or to control blood glucose levels overnight or during periods of fasting. Children with T2DM may need to take oral medication, insulin, or both. A healthy diet, adequate exercise, and weight management may decrease the risk of getting T2DM.

Signs/Symptoms include:

- acanthosis nigricans (darkening and thickening of skin around neck and armpits);
- fatigue;
- increased thirst;
- increased urination;
- nausea;
- rapid weight loss;
- blurred vision;
- frequent infections; and
- slow healing of wounds or sores.

The following are risk factors associated with the development of Type 2 Diabetes:

Risk Factors include:

- being overweight (greater than 85 percentile for height/weight);
- having a family member who has Type 2 diabetes or a mother who had gestational diabetes;
- being physically active less than three times a week; and
- being African American, Hispanic/Latino, Native American, Asian, or Pacific Islander Ethnicity (Diabetes Risk Factors, 2021).

GESTATIONAL DIABETES

Diabetes that develops during pregnancy is referred to as gestational diabetes, and is caused by the hormones of pregnancy. The hormones can cause insulin resistance or a shortage of insulin. This type of diabetes usually subsides once the baby is born, but a woman who has had gestational diabetes is more prone to developing Type 2 Diabetes later in life. In addition, the offspring of a pregnancy affected by gestational diabetes is at increased risk for obesity and developing Type 2 Diabetes (Diabetes Risk Factors, 2021).

MODULE C: AUTHORIZATION FOR TREATMENT

Module C outlines the documentation needed to provide care, ongoing management, and emergency treatment of children with diabetes while in school. It is important for each student with diabetes to have a Diabetes Medical Management Plan authorized by the healthcare provider and parent/guardian in order to provide safe and appropriate care.

The local school requires documentation of the diagnosis of diabetes by a licensed physician, nurse practitioner, or physician's assistant; authorization for treatment by the prescriber at school; and parental consent for this treatment to occur while the student is in school. The Virginia Diabetes Council is a non-profit agency of committed diabetes educators, clinicians, health providers, and volunteers dedicated to helping those affected by diabetes by the provision of resources, quality care, and support. In collaboration with diabetes experts and the Virginia Department of Health, a Diabetes Medical Management Plan (DMMP) was developed to be completed by healthcare providers. The DMMP, adapted from the National Diabetes Education Program, is specific for each child's care while in school. Consent forms for the administration may be obtained in the school health office and by the resources listed below.

- The [Virginia Department of Education](#); and
- The [Virginia Diabetes Council](#), which provides sample DMMP and supplemental forms for healthcare providers.

Authorization must be updated **each school year** as follows.

1. The student's parent or guardian needs to give written permission for the student to be treated at school, following the DMMP per *Code of Virginia*.
 - a. § [22.1-274.\(E\)](#), Prescriber authorization and parental consent shall be obtained for any employee who is not a registered nurse, nurse practitioner, physician, or physician assistant to assist with the administration of insulin and administer glucagon.
2. The treating healthcare provider must provide written authorization for insulin and/or glucagon to be given at school and procedures for treating diabetes. This information is contained in the DMMP.
3. Local school board policy may require additional forms for treating students with chronic health conditions.
4. Registered Nurses (RN's) may administer medications and treatments prescribed by persons authorized by law to prescribe such medications and treatments as denoted in § [54.1-3000](#) of the *Code of Virginia*.
5. School nurses may consult the parent for a specific medication dose only if the prescribing healthcare provider has provided a written dosage range in the student's Diabetes Medical Management Plan (DMMP).

MODULE D: PRINCIPLES OF MEDICATION ADMINISTRATION

Module D addresses the principles of medication administration for students in the school setting. This includes delegation of direct care, authorization, documentation, storage of medication, and parental responsibilities to the school for students with diabetes. Each local school division should have its own school board policy for the administration of medication in the school setting.

The state laws and regulations that govern the legal practice of nursing in Virginia are commonly known as the *Virginia Nurse Practice Act*. These laws and regulations must be followed when developing local school board policy for the administration of medication at school by a Registered Nurse (RN) or Licensed Practical Nurse (LPN). The *Virginia Nurse Practice Act* does not permit RNs to delegate the administration of medication; ***“Therefore, if medication administration is to be performed by personnel who do not hold appropriate healthcare licensure, the building administrator must designate who will perform this task in the absence of the nurse.”*** ([Regulation BON 2021](#))18VAC90-19-280It is highly recommended that building administrators become trained to administer medications in the event they are the only personnel available to care for the student with diabetes.

The *Code of Virginia* § [22.1-274.D](#) specifies that certain employees may decline to provide health-related services without fear of disciplinary action: “With the exception of school administrative personnel and persons employed by school boards who have the specific duty to deliver health-related services, no licensed instructional employee, instructional aide, or clerical employee shall be disciplined, placed on probation or dismissed on the basis of such employee's refusal to (i) perform non-emergency health-related services for students or (ii) obtain training in the administration of insulin and glucagon. However, instructional aides and clerical employees may not refuse to dispense oral medications.”

The following helps to clarify those who may and may not refuse to provide health-related services:

DELEGATION OF DIRECT CARE

Glucagon Insulin Administration

Blood Glucose Monitoring Assistance

Instructional aide - **May Refuse**

Clerical - **May Refuse**

Instructional staff - **May Refuse**

Administrators - **May Not Refuse**

Persons hired to render care* - **May Not Refuse**

Oral Medications

Instructional aide - **May Not Refuse**

Clerical - **May Not Refuse**
Instructional staff - **May Refuse**
Administrators - **May Not Refuse**
Persons hired to render care - **May Not Refuse**

Non-Emergency Procedures/Treatments

Instructional aide - **May Refuse**
Clerical - **May Refuse**
Instructional staff - **May Refuse**
Administrators - **May Not Refuse**
Persons hired to render care - **May Not Refuse**

(Information used with permission of the School Health Coordinator, Office of School Health Services, and Virginia Beach City Public Schools).

*Aside from the designated nursing staff, “persons hired to render care” also includes persons such as classroom assistants and “one-on-one” personal assistants hired with that specified job duty.

**Non-emergency type procedures and treatments (health-related services for students), such as, but not limited to, simple dressing changes, nebulizer treatments, uncomplicated catheterizations, and helping with uncomplicated gastric tube feedings.

MEDICATION AUTHORIZATION

Authorization for medication administration should follow school division policy. The written authorization should include the following information:

- student’s name;
- licensed prescriber’s name, telephone number, and signature;
- date prescription written;
- name of the medication;
- dosage to be administered;
- route of administration;
- time of day to be given;
- frequency of administration and whether it can be repeated;
- anticipated length of treatment;
- diagnosis or reason the medication is needed (unless reason should remain confidential);
- serious reactions that may occur if the medication is not administered;
- special handling instructions; and
- additional dosing at school as needed if home doses are missed.

Medication authorizations that are lacking essential information for safe delivery of a medication or that are unclear warrant clarification by a licensed healthcare provider, ideally a school nurse, before medications are administered in the school setting. Any change in the child’s medical condition necessitating a change in the original

medication authorization requires a new written authorization and a corresponding change in the prescription label.

Medication orders or changes in medication orders should never be accepted from parents or others who are not licensed to prescribe in Virginia. School nurses may consult the parent for a specific medication dosage only if the prescribing healthcare provider has given a written dosage range. The dose determined by the parent must be within the stated range.

Faxed authorizations may be acceptable if there is a signed parental consent for the medication authorized by fax.

In an emergency or under urgent circumstances, verbal orders for medication changes may be taken over the telephone by a registered nurse from a licensed prescriber, if this is consistent with local school division policy. Telephone authorization for changes in medications should be recorded on the student's record and be a one-time order only. Telephone authorization should be followed by a written order from the licensed prescriber within 24-hours. Prior consultation with the parent is optimal. If orders are received due to a health care emergency, and prior consultation with the parent is not in the student's best interest, the parent should be notified as soon as possible after the event.

It is acceptable to receive diabetes medication authorization on any of the following forms.

- Standardized medication form (samples provided by the [Virginia Department of Education](#)).
- Standardized DMMP or the appropriate individual page of the DMMP (with healthcare provider signature) provided by the [Virginia Diabetes Council](#).
- [Addendum to the DMMP](#) as found on the Virginia Diabetes Council website.
- Medication authorization form developed by the individual school division.
- Licensed prescriber's stationary or prescription pad.

MEDICATION ADMINISTRATION

Since most children spend the majority of their waking hours in school and at school sponsored activities, it is important that designated staff receive training to perform selected health care tasks. Many students with diabetes will be able to do most or all of their own care, but all students will need help in an emergency. One of these tasks is the administration of medication. Designees taking the training to administer insulin and glucagon should receive instruction in the basic principles of medication administration as well as an understanding of the signs and symptoms of diabetes, hyperglycemia, hypoglycemia, and administration of medications related to diabetes care.

The VDOE's manual, [Medication Administration School Nurse's Guide: A Training Manual for Unlicensed Public School Employees](#) provides further guidance in administration of

medication. The original authorization, as developed and approved by the Virginia Boards of Nursing, Medicine, and Education, for school staff to receive training in the administration of insulin and glucagon included the basic principles of medication administration as one of the required training components. The “six rights of administering medication” are listed as an important safety precaution when administering medications.

The “six rights” of giving medication are:

- right student;
- right medication;
- right dose;
- right time;
- right route (by mouth, injection, etc.); and
- right documentation.

The *Code of Virginia* § [22.1-274](#) includes the language below.

- If a registered nurse, nurse practitioner, physician, or physician assistant is present, no other school employee may administer insulin or glucagon.
- The *Virginia Nurse Practice Act* does not permit registered nurses to delegate the administration of medication. The building administrator must designate which unlicensed staff members will receive training and administer medication in the nurse’s absence.
- Prescriber authorization and parental consent shall be obtained for any employee who is not a registered nurse, nurse practitioner, physician or physician assistant to assist with the administration of insulin and administer glucagon.
- The school nurse should provide ongoing training and feedback to school staff administering medications in his or her absence, per § [54.1-3000](#) of the *Code of Virginia*.
 - The medication label should be reviewed by the school nurse, principal, or principal’s designee prior to giving the first dose. An exception to this would be the administration of medication via insulin pump ([Medication, 2020](#)).

The *Medication Administration School Nurse’s Guide: A Training Manual for Unlicensed Public School Employees* (VDOE, 2020) further recommends the principal or school nurse should ensure the following:

- Medications are administered by trained school staff.
- Parents provide the school with the medication in a correctly labeled pharmacy container (The exception to reviewing the medication label would be for students receiving insulin per insulin pump).
- Medication is given correctly and documented appropriately.
- Appropriate forms are completed prior to giving a medication, including prescriber authorization and parental consent.
- Medication is properly labeled and stored in a secure, safe place.

DOCUMENTATION OF MEDICATION ADMINISTRATION

Documentation of medication administration is often referred to as the “sixth right” of medication administration. The *Medication Administration School Nurse’s Guide: A Training Manual for Unlicensed Public School Employees*, (VDOE, 2020) outlines the record keeping associated with medication administration to students.

Each time a medication is administered to a student, a record should be kept of:

- the name of person administering the medication;
- the name of student receiving the medication;
- the name of the medication;
- the time it was given;
- the dose given;
- the route or manner in which it was delivered (e.g., oral, subcutaneous, intramuscular); and
- any unusual observations or circumstances.

The documentation of medication administration should occur **immediately after** medication is given. Failure to document that a task has been completed could lead other staff to think a medication has not been given and result in the student receiving extra doses of medication. Failure to document could result in accusations against the individual for being neglectful of their responsibility. Documenting before a task is completed could lead other staff to think medication has been given and result in the student missing a dose of medication.

With the exception of the insulin pump reservoir, when medication is brought to school, the amount of the medication in the container should be documented. When the medication is insulin or glucagon, the vial should be unopened and unexpired. When a vial of insulin is opened label the bottle with the date it was opened and initials of the person who opened the bottle. Open bottles of insulin should not be accepted.

STORAGE OF SUPPLIES

Each local school division should have policies regarding the secure storage of medications and related supplies. Medications and syringes should be stored in a clean locked cabinet or refrigerator according to the laws, policies, and guidelines of the Commonwealth of Virginia and the local school division. The keys to a locked cabinet, box, or cart should always be kept on the person of the individual responsible for medication administration during school hours. These should be easily accessed by the trained diabetes personnel in an emergency.

PARENT/GUARDIAN RESPONSIBILITIES

Parents/guardians have the primary responsibility to assure the health and well-being of their children and are responsible for assisting in the following ways for the safe delivery of medication in the school setting (Davis-Alldrift & Patterson, 2017).

- Provide the school with a written authorization form from a licensed prescriber which includes the student's name, name of the medication, dosage, time to be given, method by which it is to be given, name of the licensed prescriber, date of the prescription, expected duration of administration of the medication, and most importantly, possible toxic effects and side effects.
- Provide a new written authorization form, signed by the licensed prescriber and the parent/guardian, for any changes in medication, dosage, or the manner in which it is administered.
- Provide the medication in an unopened pharmacy container correctly labeled as required by school policy and refill medications in a timely manner.
- Administer the first dose of any new medication at home.
- Transport medication to and from school per school division policy.
- Provide the school with the necessary supplies and equipment called for in the DMMP. (A sample list of recommended diabetes care supplies for school is found in [APPENDIX D](#)).
- Provide a duplicate supply of life-saving medication in the health office for those students who carry and use medications independently.
- Communicate with designated school staff to be sure the student does not miss or take additional doses of scheduled medication if school is delayed or closed early, such as for inclement weather.
- Reclaim leftover medication no later than the last day of school. Medication will be destroyed the last day school staff is in the health office, or the last day of school if a nurse is not routinely present.
- Collect medication that has been discontinued. Expired or discontinued medication cannot be held at the school and will be destroyed.

MODULE E: INDIVIDUALIZED CARE PLANS

In Module E, participants will recognize the importance of having a student- specific plan on diabetes management for students in the school setting. The Diabetes Medical Management Plan (DMMP) provides instructions to school staff on providing safe and appropriate care to the student. The DMMP should be made available to the school staff by the parent or guardian at the start of school and may need to be updated during the school year.

DIABETES MEDICAL MANAGEMENT PLAN

The DMMP is developed by the student's personal health care team and contains the medical orders that are the basis for the student's health care and education plans. The DMMP provides the school personnel information that is necessary to safely care for the student during the school day, on field trips, and when participating in school sponsored extracurricular activities and during unusual school situations such as emergency evacuation or extended sheltering in place. A new DMMP should be completed each school year, and every effort should be made to have it in place before the first day of school.

If the health care provider makes changes to a student's plan of care during the school year, the school will need a new or updated DMMP form in order to implement the changes. Updated orders can be received from the physician on the DMMP form, the addendum to the DMMP, on the physician's stationary, or on the physician's prescription pad. Registered nurses taking orders from a physician over the phone are required to get the order in writing within 24-hours.

Sample Diabetes Medical Management Plans are provided by:

- the website of the [Virginia Diabetes Council](#);
- the VDOE [School Health Services](#) webpage;
- the physician's office; and/or
- the school division's website.

INDIVIDUALIZED HEALTHCARE PLAN (IHP OR IHCP)

The school nurse develops an Individualized Healthcare Plan (IHP) in partnership with the student and his or her family, based on the medical orders in the DMMP and the nurse's assessment (NASN: Diabetes Mgmt. School, 2017). The IHP should be updated at least annually and as the student's health care status or needs change.

An IHP is required for each student diagnosed with diabetes. The IHP must not be mistaken as a replacement for an Individualized Education Program (IEP) or Section 504 Plan. The IHP may be used as a supplement to the IEP or Section 504 Plan as deemed appropriate by the school division.

The RN uses nursing assessment skills to assess the student's health status. The IHP provides a foundation for:

- communicating the specific care the student with diabetes needs on a daily basis and in the event of an emergency at school;
- documenting the plan of care; and
- Identifying individuals participating in the care of the student.

The IHP will comply with state requirements as well as local school division policies and procedures. The following is a list of some recommended components in an IHP for a student with diabetes.

- Current photograph of the student, if available.
- Emergency contact information for parent/guardian, parent designees, and health care provider.
- List of known allergies and/or other chronic conditions.
- Target blood glucose ranges and appropriate interventions to help achieve these ranges:
 - blood glucose monitoring;
 - orders for medication administration, including doses and routes;
 - student-specific signs/symptoms of hypo or hyperglycemia with health care provider prescribed treatment;
 - nutritional needs/eating plans, including times and amounts;
 - physical activity plan, including limitations;
 - student's health care supply list and storage location(s);
 - nursing assessment and nursing diagnoses;
 - assessment of the student's developmental level with expected level of independent self-care skills (as authorized by the prescriber), and competency/adherence history;
 - desired goals and outcomes for health and education;
 - specific information regarding any nursing interventions that are assigned to designated trained staff. Assigned tasks must follow nursing practice guidelines for delegation of care (NASN: Nursing Delegation School, 2019);
 - list of specific designated unlicensed assistive personnel trained and authorized to provide care;
 - information on any special accommodations that must be made for field trips or extra-curricular activities; and
 - "disaster" or "lock-down" procedures or planning, where a 24/72 hour supply of medication(s), supplies, food, and water are stored at the school.

EMERGENCY ACTION PLANS FOR HYPOGLYCEMIA AND HYPERGLYCEMIA

The Emergency Action Plans (EAP) for hypoglycemia and hyperglycemia are developed by the school nurse and are based on the medical orders from the Diabetic Medical Management Plan (DMMP). The EAP is individualized for the student, states the symptoms of hypoglycemia and hyperglycemia and the steps to take in an emergency.

All school personnel who interact with the student in a supervisory role, such as classroom and special subject teachers, resource teachers, coaches, trainers, bus drivers, and cafeteria staff should receive a copy of the plan. The school nurse should provide training for appropriate school staff. This training should be updated for any pertinent changes.

EDUCATION PLANS

The school-health team members should be a part of the group that determines the student's needs for services to manage diabetes safely and effectively. School-health team members should be a part of the group that plans how the DMMP will be implemented as well as a part of the group that determines the student's eligibility under section 504 of the *American with Disabilities Act*, and/or *IDEA*. The nurse should assess the needs of the student and these needs should be reflected in the education plan. The information in the DMMP and IHP should be used in developing either a Section 504 Plan or an IEP but is not a substitute for these plans (Helping the Student, 2020).

Individualized Education Program (IEP)

An IEP is required for all students with disabilities who receive special education and related services under *IDEA*. The IEP is developed by a team including the student, parent/guardians, teachers, IEP coordinator, and other personnel with expertise regarding the student, such as the school nurse, psychologist, or school counselor.

504 Plan

The term "504 Plan" refers to a plan developed to meet the requirements of a federal law that prohibits discrimination against people with disabilities, Section 504 of the *Rehabilitation Act of 1973* (commonly referred to as "Section 504"). A 504 Plan sets out the actions the school will take to make sure the student with diabetes is medically safe, has the same access to education as other children, and is treated fairly. It is a tool that can be used to make sure that students, parents/guardians, and school staff understand their responsibilities and to minimize misunderstandings (ADA: Diabetes in School, 2016).

Educational Plan Considerations for a Student with Diabetes

Individual students with diabetes have different needs, but their education plans are likely to address the common elements listed below.

- Where and when blood glucose monitoring and treatment will take place.

- Identity of unlicensed assistive personnel; the staff members who are trained to perform or assist with diabetes care tasks such as monitoring blood glucose, administering insulin and glucagon, and treating hypoglycemia and hyperglycemia.
- Location of the student's diabetes management supplies.
- Use of smartphone, school phone, insulin pump, continuous glucose monitor (CGM), or computer to log data and/or to notify the school nurse or parents/guardians of student's blood glucose levels.
- Need for easy access to the restroom and water.
- Nutritional needs, including provisions for meals and snacks.
- Full participation in all school sponsored activities and field trips provided by trained diabetes personnel.
- Alternative times and arrangements for academic exams if the student is experiencing hypoglycemia or hyperglycemia.
- Permission for absences without penalty for health care appointments or illness.
- The opportunity to make up schoolwork missed due to health care appointments or prolonged illness, including appropriate arrangements for meeting educational needs during or following an illness.
- Maintenance of confidentiality and the student's right to privacy.

Forms

School divisions may supply their own forms. Samples of forms are available in the [Diabetes Training Resources](#) section of this document. The information needed to safely care for students with appropriate parent and provider approval should be consistent with the federal and state laws.

MODULE F: THERAPEUTIC MANAGEMENT OF DIABETES

After reviewing Module F, the participant will be able to effectively manage a student diagnosed with diabetes in the school setting. It is important for school staff to understand and follow their local school division policies.

The effective management of diabetes in children requires multiple daily tasks. A caregiver will be asked to:

- Be familiar with and follow the healthcare providers orders contained in the student's DMMP;
- Be familiar with and follow other education health plans;
- Follow local school division policy, state, and federal laws;
- Check blood glucose levels;
- Calculate carbohydrate content of food;
- Administer insulin and/or other diabetes medication;
- Plan for disposal of sharp objects and materials that come in contact with blood;
- Recognize and treat hypoglycemia;
- Recognize and treat hyperglycemia;
- Promote regular physical activity;
- Be familiar with devices used by the student such as a continuous glucose monitor (CGM), insulin pump;
- Plan for special events, field trips, and extracurricular activities;
- Plan for disasters and emergencies;
- Promote individualized developmentally appropriate self-management skills; and
- Deal with emotional and social aspects of living with diabetes.

Diabetes management involves checking the blood glucose levels throughout the day, following a meal plan, getting regular physical activity, and administering insulin and/or blood glucose-lowering medications. These actions are taken to help maintain the blood glucose in the target range to prevent hypoglycemia and hyperglycemia (Diabetes Care School, 2015).

TYPE 1 DIABETES MELLITUS

Students with Type 1 diabetes mellitus (T1DM) do not make insulin, and therefore require the administration of insulin to treat both carbohydrates eaten and blood glucose levels that are out of the child's target blood glucose goal range set by his/her healthcare provider. Insulin replacement must occur over the course of an entire day. Therefore, most children on multiple daily injection (MDI) therapy (three or more injections a day), or insulin pump therapy, also known as continuous subcutaneous insulin infusion (CSII), will require insulin delivery at school, both as a routine or in the event of a need for correction. In addition, some children with T1DM may also require oral medications as part of their DMMP.

In order for school personnel to administer or assist in the accurate dosing and administration of insulin, blood glucose levels must be monitored and carbohydrates counted prior to calculating and giving insulin.

TYPE 2 DIABETES MELLITUS

In Type 2 diabetes mellitus (T2DM), the body initially makes, but does not use insulin properly. This is called insulin resistance. In early cases, the pancreas makes extra insulin to compensate. However, over time the pancreas cannot keep up with the need by continuing to make enough insulin to keep the blood glucose at normal levels, and the individual needs medical intervention.

For Type 2 diabetes, the first recommended treatment is usually a change in lifestyle, often with a loss in weight. Increased physical activity and following a specified meal plan may help to contribute to weight loss and result in better control of blood glucose levels without medications. Sometimes these measures are not enough to bring blood glucose levels into the target range and medications may be added to the DMMP (ADA: Diabetes in School, 2016). The DMMP written by the private health care provider will specify what medications the student needs, which at least initially, may only be taken at home before or after school. Type 2 diabetes is often managed with oral medication, but insulin, via injection may also be used to achieve glycemic control. Parents are responsible for providing medications and supplies necessary during the school day to meet their child's needs. Students with Type 2 diabetes will need a DMMP, the same as a student with Type 1 diabetes. However, because medications usually are not given in school for Type 2 diabetes, and most students with Type 2 diabetes may not have blood glucose monitoring done at school, the only additional supply needed may be a snack in the event the student becomes symptomatic from low blood glucose. Proper nutrition and adequate exercise are the cornerstones of management for Type 2 diabetes. If any supplies are needed according to the DMMP, the parent must provide sufficient amounts to last at least 72 hours, as discussed above in Type 1 diabetes.

SUPPLIES NEEDED FOR STUDENTS WITH DIABETES WHILE AT SCHOOL

Parents are responsible for providing the school with all the supplies and equipment necessary to implement the DMMP and related educational plans (Diabetes Mgmt. School, 2017). Parents will need to meet with the school nurse, teacher(s), and necessary school personnel before the student with diabetes attends school to discuss the needs of the student and the school schedule.

Arrangements should be made in advance with students who self-carry and self-manage, so that they keep their diabetic supply kit in a dedicated place where it can be found in an emergency when the individual with diabetes may be unable to take care of him/herself. However, because diabetic supplies can be life-saving, back up supplies should also be kept in the health office to reduce what the student must carry and to serve as an emergency backup should the student's kit be misplaced, inaccessible, depleted of essential materials, or in the event of a building emergency, such as emergency evacuation, sheltering-in-place, weather emergencies, etc.

The parent should provide the supplies to implement the DMMP and sustain a student's needs for at least 72 hours. Extra supplies should be housed in the school health office and replenished by the parents as they are used. For an itemized list of recommended supplies, refer to [Appendix D](#) of this document.

NUTRITION AND MEAL PLANNING

Students with both Type 1 and Type 2 diabetes have the same nutritional needs as other students. All children need to eat a healthy, well-balanced, portion-controlled diet satisfying age, weight, and height caloric needs to promote optimal growth and development. The individualized meal plan will be included in the DMMP and must be followed to prevent hypoglycemia or hyperglycemia. General considerations regarding nutritional recommendations of students with diabetes include the following.

- Meal plans are designed to provide maximum flexibility to meet each student's nutritional needs, appetite, eating habits, and schedules.
- The major difference with a meal plan for a student with diabetes is that the timing, amount, and content of the food that student eats, especially carbohydrates (or carbs), is carefully matched to balance the action of the insulin/or other diabetes medications that they take.
- Because carbohydrates (carbs) affect blood glucose levels more than any other nutrient, they are the major focus of most meal planning approaches.
- While there are no "forbidden foods," the American Diabetes Association (ADA) does recommend that students limit "liquid carbs" such as sweetened beverages like sports drinks, fruit juices, and soft drinks with sugar to the treatment of hypoglycemia as these carbs containing foods raise blood glucose levels quickly.
- Some students with Type 2 diabetes may follow a meal plan that is designed to help them achieve a healthy weight and manage their glucose level. This diet may prescribe a daily healthy caloric target and/or carb content for each meal.

Carbohydrate (carb) counting is the most popular approach to meal planning for children and youth (Helping the Student, 2020,). Carbs are composed of starches or sugars and found in dairy products, starchy vegetables, grains, pastas, fruits, juices, and sweets. Adults assisting children and adolescents with diabetes management must be sure to check for "hidden" carbs in foods such as condiments, sauces, and dressings.

When the health care provider develops the meal plan portion of the DMMP, he/she takes into account the other components of the DMMP, including factors such as medication and activity level. The goal is to balance these components of diabetes management to help the student achieve optimal glycemic control. Students might need assistance in determining what and how much to eat, especially when newly diagnosed. School staff specified in the IHP must be knowledgeable of the student's meal plan requirements.

Adults assisting students with diabetes must remember it is important to read the labels on foods to determine the number of servings in a container and the number of grams of carbs per serving. Adults must even check the labels on products listed as sugar-free, such as cookies, candies, and ice cream. They often contain carb amounts

similar to their non-sugar-free counterparts. It is preferable to use regular products in appropriate portions, rather than trusting that “sugar-free” products are suitable for a person with diabetes.

Adults working with families of students with diabetes may find it useful to encourage parents to plan ahead and review weekly school lunch menus to determine the carbohydrate content of the meals available. The food service manager should have access to the nutritional content of the food available in the cafeteria. If a food vendor for an item changes, or the vendor updates their food label, assistive personnel should be sure to check to see if there are differences in the nutritional content of the new food item(s). The United States Department of Agriculture (USDA) maintains a [National Nutrient Database](#) containing nutrient information on over 8,000 foods and beverages and is a good reference for carbohydrate content of foods. Additional information is listed in the [Diabetes Training Resource](#) section of this manual.

If the parent provides food from home, it is helpful for the parent to provide the school with the carb count for the food item or meal. A diabetes educator can also help locate resources for nutritional needs, such as [CalorieKing](#). The insulin-to-carb ratio method gives more flexibility to the student, but it may also take more time and attention to track the carbs throughout the day. For younger students, a trained adult should know the child’s meal plan and work with the parent to coordinate it with the school’s scheduled snack and meal times when possible.

The parent should be notified in advance whenever special events are scheduled that might affect the meal plan. This includes special parties or events during the normal school day, after school activities, and day or extended field trips. Birthday celebrations often present unexpected situations where food decisions must be made. Talking to the parent in advance and deciding how they would like to handle unexpected treats can help avoid difficulty and enable the student to participate in the celebration. The parent may choose to have the school nurse keep snacks on hand or arrange to have the child bring the food item home. School days when there is an increased amount of physical activity may necessitate the child having extra snacks. Examples are the days when there is physical education class or a “Field Day.”

The healthcare provider may indicate a carb ratio range on the DMMP, allowing the parent to adjust the carb ratio within this range. If the carb ratio is within the range, indicated, no further medical order is required. If the parent is requesting a ratio out of the range, a new medical order must be obtained.

According to the NDEP, there are two methods of meal planning using carb counting: (1) following a consistent carb intake meal plan and (2) adjusting insulin for changing carb intake. This information will be specified in the student’s DMMP as to how to calculate an insulin dose. Refer to the [Calculation of Insulin Dose](#) section of this document for more information (Kennedy, 2021).

PHYSICAL ACTIVITY

Everyone can benefit from regular exercise. Exercise and physical activity are critical parts of diabetes management. In addition to maintaining cardiovascular fitness and controlling weight, physical activity can help to lower blood glucose levels. Students with diabetes should participate fully in physical education classes and team sports.

The healthcare provider will indicate in the DMMP if the student will need to eat a snack prior to scheduled physical activity. To maintain blood glucose levels within the target range during extra physical activity, students will need to adjust their insulin and food intake. To prevent hypoglycemia, they also may need to check their blood glucose levels more frequently before, during, and following physical activity. The student's DMMP should specify when physical activity should be restricted because the blood glucose level is too high or too low or if ketones are present.

It is best to exercise or take physical education classes 30-60 minutes after a meal to allow time for food to be absorbed. A person with diabetes always needs to have a fast-acting sugar readily available for treatment of low blood glucose, along with plenty of water.

Exercise increases the flow of blood in general, but especially to the muscles that are being used the most. Insulin is absorbed faster when there is increased blood flow to the exercising muscles. For example, if insulin is injected in the arm before a run or swim, it may be absorbed quickly and cause a low blood sugar. Muscles use the body's sugar stores during and after exercise: therefore, the body needs to replace this supply of sugar. The body does this by taking glucose out of the blood, lowering the blood sugar level, a process that may continue for up to 12-hours after exercising.

Students using insulin pumps may maintain or disconnect from the pump for sports activities. The IHP should address storage of the pump if it is removed for physical activity. It should be stored in a secure location. If a student keeps the pump on, he/she may set it at a temporary, reduced rate of insulin while he/she is at play. Specific instructions for what the student should do and how temporary basal rates should be adjusted should be addressed in the DMMP. The student's DMMP and IHP should include specific instructions for physical activity. If these instructions are lacking, the prescriber should be contacted for guidance. Feedback to the prescriber about exercise tolerance and measured blood glucose levels is considered good practice.

DEVELOPMENTALLY APPROPRIATE SELF-MANAGEMENT OF DIABETES CARE

The NDEP states, "students with diabetes must deal with not only the usual developmental issues of growing up, but also with learning to manage this complex chronic disease" (Helping the Student, 2020). Diabetes affects every facet of life, complicating the task of mastering normal developmental challenges. Individuals will react differently to having diabetes, and the associated emotions may run the gamut

from accepting, to denial, to resentful. Students may be open with some people about their illness or try to hide it from others.

Children and adolescents, in general, do not want to be different from their peers, but having diabetes and the associated self-care tasks can make them feel different, especially if others treat them differently. They may feel conflicting pressures to comply with their DMMP but also to fit in with their peers. It is important that the student feel supported and that staff be aware of emotional or behavioral issues that may need referral.

The child's ability and willingness to learn and assume responsibility for self-care tasks is individualized. The ADA's position on diabetes care in school states,

“Children and youth should be allowed to provide their own diabetes care at school to the extent that it is appropriate based on the student's development and his or her experience with diabetes. The extent of the student's ability to participate in diabetes care should be agreed upon by school personnel, the parent/guardian, and the health care team, as necessary. The ages at which children are able to perform self-care tasks are variable and depend on the individual, and a child's capabilities and willingness to provide self-care should be respected.” (Diabetes Care School, 2015).

The DMMP and the plans of care will specify which tasks the provider and the parent consider the child to have mastered and the ones for which the student needs assistance. No matter the level of independence, a student experiencing symptoms of either high or low blood glucose during an emergency may need someone to help.

The American Diabetes Association provides [Tips for Teachers of Students with Diabetes](#) to assist them in remaining safe and supported at school. Some highlights are listed below.

- Understand that all children with diabetes are different and react differently to symptoms of low blood glucose.
- Always be prepared and have a snack available. Take it with you whenever you leave the classroom.
- Never leave the student with diabetes alone if they are experiencing symptoms of low blood glucose. If they need to go to the office or see the nurse, send a responsible person with them.
- Allow the student with diabetes unrestricted access to the bathroom and to water.
- Remember that variations in blood glucose can interfere with the student's ability to organize things or to concentrate.
- For academic testing, children with diabetes may need to check their blood sugar before, during, or after the test as the stress of test taking may alter blood sugar levels.

- Communication with substitute teachers is important in providing continuity of care.
- Learn about diabetes and keep the lines of communication between school and home open.

A child or adolescent with diabetes warrants the dignity, privacy, and confidentiality of any person with a medical condition. School staff should refrain from casual discussions in hallways or faculty lounges, even when names are not mentioned, because they can prove damaging.

Diabetes is a bona fide medical condition that can cause irritability and confusion that could be mistaken for misbehavior when blood sugars are too high or too low.

Adults responsible for a student with diabetes should remember to check a student's blood glucose levels if there is an unusual change in the student's behavior.

AGE-APPROPRIATE SELF-MANAGEMENT GUIDELINES

“Diabetes care depends upon self-management. The student’s competence and capability for performing diabetes-related care tasks should be specified in the Diabetes Medical Management Plan (DMMP) and then applied to the school setting by the school health team, as outlined in the student’s Individualized Health Care Plan and any education plan. Although students must receive assistance with and supervision of their diabetes care when needed, it is equally important to enable students to take on the responsibility of diabetes self-management with ongoing guidance and support from the parents/guardians, the student’s personal diabetes care team, and the school health team.” (Helping the Student, 2020).

The age at which a child is able to successfully perform self-care tasks will vary and depend on the individual. A child’s capabilities and willingness to provide self-care should be assessed and respected.

It should also be noted, Type 1 diabetics have reported feeling “burned out” at times. These feelings can last for a short time or for extended time and may appear as the student has lost interest in self-care. Lack of social support can lead to burnout (ADA, 2019).

The guidelines below are provided by the American Diabetes Association.

- **Young children (<five years of age)** are unable to perform diabetes tasks independently and will need an adult to provide all aspects of diabetes care. Many younger children will have difficulty in recognizing hypoglycemia, so it is important that school staff recognize and provide prompt treatment. However, children in this age range can often choose which finger to prick and select an injection site and are generally cooperative. ADA’s position statement on

childcare, [Diabetes Care in the School and Day Care Setting](#), should be reviewed for more information.

- **Elementary students**, depending on the duration of diabetes and level of maturity, may be able to perform their own blood glucose checks, but usually will require supervision. Older elementary students are generally beginning to self-administer insulin with supervision and understand the effect of insulin, physical activity, and nutrition on blood glucose levels. Unless the child has hypoglycemia unawareness, he or she should usually be able to let an adult know when experiencing low blood glucose.
- **Middle and high school students** are usually able to self-manage their diabetes depending on the duration of diabetes and level of maturity but will always need help when experiencing severe hypoglycemia. Independence in older youth should generally be encouraged to enable the student to engage in his or her decisions about his or her own care.

Students' competence in and capability of performing diabetes-related tasks are presented in the DMMP and then adapted to the school setting. Individuals with diabetes of any age may require assistance to perform a blood glucose check when blood glucose is low. In addition, individuals experiencing low blood glucose may need a reminder to eat or drink and should never be left unsupervised until such treatment has taken place and the blood glucose value has been rechecked and returned to the normal range. Ultimately, each person with diabetes becomes responsible for all aspects of routine care, and it is important for school staff to facilitate a student in reaching this goal. Regardless of a student's ability to provide self-care, help will always be needed in the event of a diabetes emergency.

INDEPENDENT SELF-CARE

The *Code of Virginia* § [22.1-274.01:1](#), allows students diagnosed with diabetes parental consent and approval from the prescriber to carry and use essential supplies in reasonable quantity to manage routine self-care, as well as emergency treatment of hypoglycemia or hyperglycemia, and to self-test as needed on a school bus, school property, or at a school sponsored activity. There may be circumstances when the student, especially the adolescent or even an experienced younger student, has permission to carry medications and/or supplies and to manage his/her diabetes independently. When the following documentation is in place, the practice must be allowed by the school.

- Authorization from the health care provider for the student to self-manage diabetes care as part of the student's therapeutic regimen, assuring that the student is capable of managing his/her care independently, or detailing the assistance needed by the school nurse or appropriately trained school personnel.
- Permission from the parent indicating that the child is educated to provide self-care responsibly.
- Assessment by the school nurse as to the student's ability to perform the task(s) responsibly and independently in the school setting, and the development of actions to follow in the event of hypoglycemia or hyperglycemia.

In developing a good working partnership among the medical home, the family, the student, and the school, there is the optimal opportunity for a mutually beneficial relationship achieving the medical home's and parent's goals of self-management and the school's need of assuring the safety of the student with diabetes as well as all students. Students should also demonstrate an understanding of school policy and procedure in the performance of self-care tasks (JDRF Toolkit, 2014).

While Virginia law permits students with diabetes to self-carry and manage their medical needs, it should be noted that when the student carries and self-administers medications or performs self-care tasks independently, there is an implied expectation that he or she will carry out self-care in a responsible, safe, and mature manner. It is expected that the student will keep medications in a secure, dedicated location known to the student and the school nurse or other trained staff member will facilitate assistance in the event of an emergency. Extra supplies, provided by the parent/guardian, should be housed in the health or main office in the event the student's personal supply is lost or cannot be located in an emergency. Parents, students, and the school nurse should determine documentation of self-care and appropriate staff intervention.

Students who carry their own supplies and self-manage their diabetes are not exempt from disciplinary action if they fail to follow school policies and procedures. The parent, student, and school nurse should develop a plan for monitoring compliance to the diabetes plan based upon the health care provider's recommendations. Concerns that the student is not following the plan should be communicated to the parent and health care provider.

BARRIERS TO APPROPRIATE DIABETES MANAGEMENT

Lack of knowledge and/or fear can be a barrier to appropriate diabetes care. Caring for someone with diabetes can be stressful for the individual and the family, especially when the child or adolescent does not recognize, is embarrassed by, or is afraid of low blood glucose symptoms. They may manage their diabetes by not taking all of their insulin or eating extra carbs. The normal difficulties encountered by parents and their children may be compounded by the stress of diabetes care. School staff, especially school nurses, can provide parents with the support they need as well as assistance with educational resources.

As the child moves into the teenage years, those who were previously compliant may rebel or not be totally honest about self-care tasks such as blood glucose testing. In addition, the physiological changes of adolescence, such as rapid growth and surges in hormones, may make it more difficult to keep blood glucose in the target range, despite compliance (JDRF Teen Toolkit, 2013). This can lead to the teen with diabetes feeling frustrated and may contribute to the child's becoming less engaged or compliant with the DMMP. Teens need support to move toward independence, but they also need supervision to make sure they are caring for themselves properly.

Students with diabetes are at risk for eating disorders, and school staff should be aware of this. Some students, particularly females, may omit insulin as a quick way to lose weight, putting them at risk for hyperglycemia and ketoacidosis. Binge eating and bulimia are also seen in students with diabetes.

MODULE G: MONITORING BLOOD GLUCOSE

Module G describes the various methods of monitoring a student's blood glucose, use of blood glucose meters (glucometers), and procedure for testing and use of a device for continuous glucose monitoring of students while in school.

One of the most important diabetes management tasks is to check (or monitor) blood glucose levels throughout the day using a blood glucose meter or a continuous glucose monitor (CGM) (Helping the Student, 2020). Some students who use a CGM use a blood glucose meter to verify the CGM reading. The physician usually requests that a student self-check blood glucose level, with or without adult oversight, depending on the skill level of the student, at various times during the school day such as:

- before eating snacks or lunch;
- before physical activity;
- before leaving school on the bus; and/or
- as needed, such as when the student has symptoms of either a high or low blood glucose.

The blood glucose self-test provides the information necessary to make appropriate choices about food and activities, as well as insulin dosing. The primary health care provider or diabetes educator will provide guidance on how frequently the student's blood glucose should be checked during the day in the DMMP. There is no specific number of blood glucose checks, which should be done per day, as different people require different treatment options. The frequency of routine blood glucose monitoring should take into consideration the student's schedule and participation in classroom learning/activities. Too frequent routine glucose monitoring may impact learning and school participation. On average, a student would have routine glucose monitoring one to three times during the day unless otherwise indicated in the physician-ordered DMMP.

Optimal communication between the school, the home, and prescriber is important. If a student's blood glucose during the school day is chronically low or high or outside the blood glucose parameters given on the DMMP, it is essential that the school share the blood glucose log, as soon as a concern develops. Most CGM's can transmit data remotely to multiple devices at the same time via smartphone technology. The student's health care provider as well as parents/guardians can have access to the CGM data and alarms in real time at locations remote from the student (Helping the Student, 2020).

Students with Type I Diabetes Mellitus who are participating on sports teams may have to check their blood glucose level more frequently, especially during the first weeks of practice. Changes in the level of physical activity may alter dietary and insulin needs. One of the purposes of blood glucose monitoring is to keep blood glucose levels in the target range specified on the DMMP. Blood glucose target ranges are very individualized and are determined by the healthcare provider. The range is customized to the

student's needs and will change as growth and diabetes treatment changes. Monitoring of A1-C levels (a blood test) done by the healthcare provider, which indicates how well the student is maintaining the target range, may also result in changes in the insulin dosing prescription in school.

For students with Type 2 Diabetes Mellitus, monitoring blood glucose levels is just as important. Certain medications used in the treatment of T2DM can cause hypoglycemia. Regular blood glucose monitoring can help determine if a change in the student's treatment is needed.

Students must be able to test their blood glucose levels and respond to levels that are too high or too low as quickly as possible. If indicated by the health care provider and with parental permission, the student should be allowed to test and treat in the classroom or any place or time during the school day or while participating in school-sponsored activities.

According to the American Diabetes Association, the parent/guardian should provide the school with all materials, equipment, supplies (meter, test strips, lancets, lancing devices, insulin, backup syringes, pump supplies, etc., if needed), and/or other items necessary for diabetes management. Parents are to be notified in advance when supplies are running low and as soon as possible if equipment needs to be replaced (ADA: Diabetes Care in School, 2015).

Disposable gloves (non-latex or vinyl), that meet OSHA requirements for handling body fluids, are to be worn if someone is performing the testing other than the student (OSHA, 2013). The employer is responsible for providing personal protective equipment for its employees, as well as safe used sharps containers and hazardous waste receptacles if needed.

BLOOD GLUCOSE METERS

A blood glucose meter is a small portable machine used to check blood glucose levels. There are several models of meters on the market and each one may function differently. Within the school, there may be students using several different types of meters and staff responsible for the care of the student must become familiar with each of them. Individuals involved with glucose monitoring must be familiar with the manufacturer's instructions to ensure correct operation of the device for accurate readings, proper cleaning, battery replacement, and storage. Heat and humidity may affect blood glucose meters and test strips and may reduce the accuracy of blood glucose readings. This is especially important when blood glucose is checked outside (e.g., on the practice field) (Helping the Student 2020).

Reference materials and instruction manuals for glucose monitoring meters should be available from the parent or manufacturer's toll-free number and/or website.

The benefits of blood glucose monitoring at school include:

- immediate test results so that adjustments in food, medication, or activity can be made;
- information to assess response to therapy and maximize student's ability to participate in learning opportunities;
- confirmation of whether symptoms relate to low (hypoglycemic) or high (hyperglycemic) blood sugar levels; and
- decreased risk to the student of long-term health complications.

Since the blood glucose test results are the basis for diabetes care, it is important to use the proper procedure to assure accuracy of the results.

The ADA lists the possible causes of inaccurate blood glucose test results as:

- operator error, such as finger not clean and dry;
- poor technique, including inadequate blood drop (not enough blood);
- code on test strip does not match code on meter (calibration);
- outdated or incorrectly stored test strip;
- unclean meter; and/or
- product malfunction.

Procedure for Blood Glucose Testing

- Review directions for blood testing meter.
- Perform control solution checks on a regular basis and when starting a new box of test strips.
- Have students wash and dry their hands. If an adult plans to assist, wash and dry hands and don non-latex or vinyl gloves before helping the student.
- Assemble supplies:
 - alcohol pad;
 - finger lancing device;
 - blood testing meter (glucometer);
 - appropriate blood testing strips;
 - tissue or cotton balls and small bandage;
 - gloves for assisting, if indicated; and
 - student's blood glucose log.
- Washing a student's hands and test site is sufficient for preparing the site; however, alcohol may be used for further prepping. Make sure the test site is dry before testing. Alcohol may cause toughening of the skin or burning sensation. If moisture (water or alcohol) remains on the skin, test results may be altered. Encourage the student to rotate sites to help prevent callus formation.
- Place glucose-testing strips into the electronic meter according to the manufacturer's instructions. The meter will turn on automatically. Check strip code, if required.
- Ready the lancing device according to manufacturer's instructions.
- Select a test site. If using a finger, use the sides of the fingertip. (The pads of the fingertips may be more sensitive). Hang the arm below the level of the heart

for 30 seconds to increase blood flow. If hypoglycemia is suspected only use the finger for testing, do not use alternate testing sites.

- Hold the lancing device to the side of the fingertip and push the button to prick the skin. Gently “milk” the finger in a downward motion from above the pricked site to obtain a large enough drop of blood on the test strip. Avoid squeezing the site excessively because excess squeezing can contaminate the sample with tissue fluid, cause hemolysis of the sample, and traumatize the site.
- Place blood on the testing strip and complete testing, according to the manufacturer’s instructions. Compress the lanced area with tissue or gauze until the bleeding stops.
- If an adult is assisting, dispose of the test strip and tissue or gauze in a lined wastebasket. Immediately and carefully, dispose of the lancing device in a sharps container. Remove and dispose of gloves. Wash hands.
- If a student is doing their own testing, remind the student to dispose of the lancing device in a sharps container, or in their own disposing kit. Remind students to dispose of test strips, tissue, gauze or other dirty supplies in lined trash containers. Remind students to wash hands thoroughly.
- Record blood glucose reading results in the student’s log or have the student record results in log. Refer to the student’s DMMP for appropriate actions. Do not refer to the blood glucose readings as “good” or “bad.” Refer to the numbers as “in” or “out” of target range, “above” or “below” target range. Report “out of target” readings to parents as indicated on the DMMP. Be prepared to share the log with the treating provider if requested or if you are seeing a pattern of “out of target range” results.

CONTINUOUS GLUCOSE MONITORS (CGM)

The use of CGM’s and glucose sensors by students with T1DM has increased dramatically over the past three years. According to data from a large Type 1 diabetes clinic registry, approximately 50 percent of children with Type 1 Diabetes Mellitus under the age of 18 have adopted this technology, and we expect to see these numbers rise as the technology becomes less expensive, easier to use, and further reduces disease burden (ADA, 2019).

The CGM works through a sensor inserted under the skin that measures interstitial glucose levels (the glucose found in the fluid between cells) at regular intervals and sends the current equivalent glucose level wirelessly to a monitor. The monitor may be part of the **insulin pump** or a separate device, which may include a smartphone that is carried or worn by the student in a pocket, a backpack, or a purse.

Per the ADA, CGM updates glucose data every five minutes, providing 288 readings per day. Most CGM’s set off an alarm when blood glucose levels are too high or too low, or when they are increasing or decreasing at a rapid rate. **Never ignore a CGM alarm.** Appropriate action should be taken in accordance with the student’s DMMP.

Some CGM’s have the option to transmit data remotely to multiple devices at the same time via smartphone technology. The school nurse and the student’s health care

providers as well as the parents/guardians can have access to the CGM data and alarms in real time at locations remote from the student. The utility of data sharing and remote monitoring varies by the student's age. In school age students, data sharing can improve coordination of care among the student, parents, school staff, and before-and after-school caregivers (ADA, 2019).

As the Food and Drug Administration (FDA) continues to approve new devices for use, the ADA notes that while there are some devices that have been approved by the FDA for non-adjunctive insulin dosing (treatment decisions), there are others that have not. Moreover, some devices require calibration with a blood glucose meter, while others do not.

Given the growing diversity of available CGM and glucose sensors, the recommendation is that before using CGM data to make treatment decisions, you should have specific school orders or a DMMP that states whether CGM data can be used to make treatment decisions or whether CGM data should be confirmed with a blood glucose meter and finger stick. The American Diabetes Association provides Guidelines for the [Use of CGM and Sensors in the School Setting](#) for schools to use as a resource (ADA CGM, 2018).

Even if a student is using a device approved by the FDA for treatment decisions, they may not have permission from the prescriber to do so. Since the prescribing doctor, nurse practitioner, or physician assistant assumes responsibility for confirming the student's readiness to use a particular device to make treatment decisions in the school setting, this must be confirmed in the DMMP or updated school orders.

A summary of benefits for the use of CGM include the following.

- Immediate access to real time glucose levels, along with personalized alerts to prompt an immediate response when the student's glucose level is above or below the prescribed target.
- Trend arrows that predict a rise or fall in a student's glucose, and the speed it is rising or falling. Newer devices can predict hypoglycemia and provide alerts to avert it.
- Insight into cause and effect, and the ability to see how different foods, activities, stress, and other factors may affect glucose levels.
- Retrospective data review, in which patterns can be identified to inform changes to the insulin regimen or behavior (e.g., indication for before meal versus post meal insulin dosing).

Other CGM Considerations can include the following.

- The school nurse should support the use of CGM devices at school and encourage setting parameters so that there is little disruption in the student's activities, thereby enhancing their education.
- Alarms should be used sparingly and set for blood glucose levels that require an immediate action response, as this will help the student avoid alarm fatigue, and enhance learning by avoiding unnecessary disruption to their learning in the classroom (Colorado Kids with Diabetes, 2020).
- If a CGM falls off at school, the school nurse should help the student place all pieces into a sealed bag to be sent home with the student. No portion of the CGM should be discarded while at school. (ADA, 2019).

MODULE H: HYPOGLYCEMIA (LOW BLOOD GLUCOSE)

In Module H, participants will learn to recognize the signs and symptoms of Hypoglycemia or low blood glucose. This module assists school staff in mitigating and implementing measures to treat a student experiencing Hypoglycemia in the school setting.

Hypoglycemia commonly referred to as low blood glucose or low blood sugar is a serious condition that can happen suddenly and requires immediate treatment. Hypoglycemia can impair a student's cognitive abilities and adversely affect academic performance. Hypoglycemia can affect attention, mood, and ability to follow directions and therefore can be mistaken for misbehavior. **The student should never be left alone or sent anywhere alone or with another student when experiencing hypoglycemia** (Helping the Student 2020).

CAUSES OF HYPOGLYCEMIA

Hypoglycemia occurs when student's blood glucose level falls too low, usually as a result of:

- too much insulin;
- skipping or delaying meals or snacks;
- not eating enough food to the amount of insulin taken;
- exercising too long or intensely;
- combination of any of the above; and
- flu, colds, or other illness such as gastrointestinal illness.

Low blood-glucose levels are more likely to occur before lunch, at the end of the school day, during or after physical education classes, or in the event of unanticipated physical activities. Hypoglycemia may occur due to illness, particularly gastrointestinal illness, or it may occur for no obvious reason. For most students, a blood glucose level of 70 mg/dL. or less is considered hypoglycemia.

The important thing to remember is that early recognition and intervention is the best strategy to prevent progression to more severe symptoms (Diabetes Care Tasks, 2018).

Hypoglycemia is not always preventable, especially in newly diagnosed students, or in students where control is difficult. Not all students, especially young children, will recognize the symptoms. This is referred to as hypoglycemia unawareness. It is imperative, therefore for school personnel to become familiar with the signs and symptoms and to be trained in immediate and proper management.

Symptoms vary from person to person and from episode to episode. In addition, adolescents who are not accepting a diagnosis may ignore early warning signs when they first occur.

Staff supervising a child with diabetes and suspected low blood sugar should not leave the child unattended at any time.

SYMPTOMS OF MILD/MODERATE HYPOGLYCEMIA

Symptoms of mild or moderate hypoglycemia include:

- shakiness;
- weakness;
- dizziness;
- cold, clammy skin;
- hunger;
- drowsiness;
- sweating;
- paleness;
- rapid heartbeat;
- visual disturbances;
- complaints of “feeling funny;”
- numbness or tingling of lips;
- yawning;
- headache;
- confusion; and/or
- inability to concentrate.

PREVENTION STRATEGIES

Strategies to prevent hypoglycemia include:

- allowing students to check blood glucose routinely per the DMMP or as needed;
- allowing testing in the classroom;
- facilitating a regular schedule for eating meals and snacks. Meals and snacks should not be skipped;
- allowing students with diabetes to eat in the classroom per the DMMP or as needed;
- reinforcing with students that injection sites should be rotated;
- always double checking insulin dosing before giving it;
- planning for extra food and/or reducing insulin amounts before exercise, in accordance with the DMMP, and in case of emergency school situations, such as shelter-in-place, emergency evacuations, lock-downs; and
- increasing the bedtime snack on unusually active days to avoid hypoglycemia during the night while asleep, according to prescribers direction.

TREATMENT GUIDELINES

Treatment is dependent on the severity of the symptoms and may vary with individuals per their DMMP and Emergency Action Plan for Hypoglycemia. Since some of the symptoms are similar to those for hyperglycemia, if in doubt, **always treat hypoglycemia first. Do not delay emergency treatment, but obtain a blood glucose level as soon as possible.** Specific treatment should be outlined in the DMMP, prepared by the health care team, but will look similar to the information given below.

What Constitutes a Medical Emergency?

For those students who cannot swallow, may be unconscious, unresponsive, or having a seizure, or whose blood glucose does not respond to treatment per the DMMP, or when glucagon is not available or cannot be administered immediately, **this is a medical emergency that requires 911 response.**

“Rule of 15” for students who can swallow

Treat with 15 grams of a fast-acting carbohydrate source, such as:

- four oz. fruit juice (not low calorie or reduced sugar);
- four oz. regular soda (half can of soda (not low calorie or reduced sugar);
or
- chew four glucose tablets or intake one tube of glucose gel.

Wait 15 minutes, then recheck the blood sugar

- If the blood glucose is less than the target range in the DMMP, keep repeating the 15 grams of carbohydrate and rechecking blood glucose level 15 minutes later until the blood glucose level is back in the desired range. If staff supervising a child with symptoms of hypoglycemia are unable to raise the blood glucose to levels indicated in the DMMP despite fast-acting glucose sources, they must contact 911 and notify the parents immediately.
- When the blood glucose level is back in the target range per the DMMP, and it is time for a snack or meal, supervising trained staff should allow the student to eat as usual and cover the meal as ordered in the DMMP. If the meal or snack time is more than an hour away, or the student will be participating in physical activity between the episode of hypoglycemia and the next normally scheduled meal, give a protein and carbohydrate snack per the DMMP. Examples of appropriate foods include:
 - whole grain crackers;
 - graham crackers squares with peanut butter or cheese;
 - saltine crackers with peanut butter or cheese;
 - granola bars; and
 - yogurt.

EMERGENCY TREATMENT FOR HYPOGLYCEMIA

Glucagon is a hormone naturally found in the body and stored in the liver. Glucagon given by injection, or most recently by nasal administration for a hypoglycemic emergency, raises the blood glucose level by causing a release of glycogen (a form of stored carbohydrate) from the liver. Glucagon is available now as a liquid that will need to be reconstituted, as well as a prefilled syringe, an auto injector, and a nasal powder. **Glucagon is a potentially life-saving treatment that cannot harm a student.**

Parents should provide necessary equipment, supplies, and medications. Even self-directed individuals are not considered independent during severe hypoglycemic events and will need immediate assistance by a trained staff member. The parents/guardians should supply the school with a glucagon emergency kit if prescribed (Helping the Student, 2020). The school nurse and/or trained diabetic personnel must know where the student's glucagon kit is stored, have access to it at all times, and be familiar with the glucagon instructions before an emergency arises.

Injectable Glucagon Products

Figure 1. Glucagon [Emergency Kit](#) (Lilly)



Figure 2. Gvoke® [Prefilled Syringe](#) (PFS)



Figure 3. Gvoke® [HypoPen/Auto-Injector](#)



Procedures for Injectable Glucagon

- Verify signs of severe low blood glucose. Do not delay treatment pending blood glucose testing if any of the signs or symptoms of hypoglycemia are noted.
- Call or ask someone to call 911. Do not leave an individual unattended.
- Position child on his/her side in a safe area with head positioned to the side. Administer glucagon per DMMP orders. After administration of the glucagon, as the child regains consciousness, nausea or vomiting usually occurs, and the student must be kept on his/her side to prevent choking.
- Inject glucagon following the procedure below if reconstituting the glucagon.
 - Obtain glucagon kit. Wash hands (if possible) and put on gloves. If gloves are not available, do not delay treatment, but use judicious precaution to avoid blood exposures.

Figure 4. Glucagon Kit



- Flip cap off the glass vial (bottle) containing the dry powder. Remove the needle from the syringe.
- Take the fluid-filled syringe in the glucagon emergency kit and inject the fluid into the vial containing the glucagon powder. Shake gently or roll to mix until all powder is dissolved and the solution is clear. Inspect medication for color, clarity, and presence of lumps. Solution should be clear and colorless.

- Hold the vial upside down and withdraw the prescribed amount of glucagon back into the syringe. The prescribed amount should be specified in the student's individualized health care plan and emergency action plan. Withdraw the needle from the vial. Generally, if the student weighs >45 pounds, the full vial (1 cc) of glucagon may be injected. If the child weighs <45 pounds, inject one-half of the solution.
 - When possible, the injection site should be exposed and cleaned. However, glucagon can be administered through clothing, if necessary. Suggested sites include the outer thigh, upper outer buttock, or arm.
 - Inject the needle straight into the muscle of the selected site and inject glucagon.
 - Withdraw the needle and press the site with a cotton ball or wipe. Massage injection site for ten seconds; apply bandage if needed.
 - Do not recap syringe. Put the used syringe in a sharps container.
 - Stay with the student. It may take 15-20 minutes for the student to regain consciousness.
-
- If a blood glucose testing kit is available, check or recheck the blood glucose. Follow the student's specific instructions for response to results. Some students may have a second injection of glucagon ordered if glucose remains low.
 - The student may be given sips of fruit juice or regular soda once awake and able to drink. This may be followed by a snack containing protein and carbohydrates such as a peanut butter sandwich or cheese crackers to keep blood glucose levels elevated to normal levels and to prevent recurrence.
 - Do not be surprised if the student does not remember being unconscious, is incoherent, or has a headache. The blood glucose may also rise over 200 mg/dL and nausea or vomiting may occur.
 - When emergency services arrive, turn care of the student over to the ambulance crew.
 - Notify parents and diabetes medical management team.
 - Document the administration of this emergency medication in the student's medical record (Glucagon, 2021).

Nasal Glucagon (Baqsimi)

[Baqsimi](#) is a new type of glucagon that is administered nasally for the treatment of low blood glucose. Follow the manufacturer's instructions regarding use of this medication at the link above.



Baqsimi®

Glucagon Storage

The manufacturer of Glucagon recommends the following.

- Store the glucagon kit at controlled room temperature between 20° to 25° C (68° to 77° F) before mixing glucagon with the diluent.
- Glucagon that has been mixed with diluent should be used immediately. Discard any unused portion.
- Solutions should be clear and of a water-like consistency at time of use.

A system should be in place for regularly checking expiration dates and communicating with parents when expiration dates are approaching. Glucagon should be replaced just prior to the expiration date.

MODULE I: HYPERGLYCEMIA

In Module I, participants will learn to recognize the signs and symptoms of Hyperglycemia or high blood glucose. This module assists school staff to mitigate and implement measures to treat a student experiencing Hyperglycemia in the school setting.

Hyperglycemia is commonly referred to as high blood glucose or high blood sugar, and means that the blood glucose levels are above the target range, as specified in the student's DMMP. Almost all students with diabetes will experience blood glucose levels above their target range at times throughout the day. For many students, these elevations in blood glucose will be only minimally above the target range (less than 250 mg/dL) and are short in duration. Other students may experience daily spikes of blood glucose levels that are high (in excess of 250 mg/dL) and of longer duration.

An isolated high blood glucose reading is cause for concern, but not alarm. For example, the blood glucose is expected to be somewhat higher following a meal or snack, but it should also drop once insulin starts to work. However, it is also important to note that hyperglycemia can occur more rapidly in students with insulin pumps if a pump malfunctions or delivers less insulin. Illness or infection can also contribute to a more rapid escalation of hyperglycemia.

Hyperglycemia becomes an increasing concern when several consecutive readings have been high, or when accompanied by vomiting. When the body cannot use glucose, it uses its own fat and muscle for energy. When there is not enough insulin- for any reason, the body starts to breakdown fat and chemical byproducts called ketones built up in the blood. At first, ketones are cleared by the kidneys and the lungs, but as production increases, they build up in the bloodstream. Ketones are measured in either the blood or the urine.

DIABETIC KETOACIDOSIS (DKA)

DKA develops over hours to days and is associated with hyperglycemia, buildup of ketones in the blood (ketosis), and dehydration. The classic signs and symptoms of DKA include severe abdominal pain, nausea and vomiting; fruity breath, heavy breathing, or shortness of breath, chest pain, increasing sleepiness or lethargy, and depressed level of consciousness. This is a medical emergency and the school nurse or trained unlicensed assistive personnel should stay with the student and have someone call 911.

In the short term, hyperglycemia can impair cognitive abilities and adversely affect academic performance. In the long term, moderately high blood glucose levels can increase risk for serious complications such as heart disease, stroke, blindness, kidney failure, nerve disease, gum disease, and amputations.

The student's DMMP should determine precisely what actions should be taken at each level of severity of hyperglycemia and should include parameters as to when to notify parents and/or the physician in the event of hyperglycemia unresponsive to school interventions.

The important thing to remember is that early recognition and intervention is the best strategy to prevent progression to more severe symptoms.

Hyperglycemia or elevated blood glucose levels can be the result of such things as:

- taking too little or no insulin;
- ingesting food that is not covered by the appropriate amount of insulin;
- decreasing the usual amount of exercise or activity;
- using "expired" insulin or insulin that was not stored properly and has lost potency;
- having an illness, infection, or injury;
- being stressed or emotionally upset;
- having hormone fluctuations as with menstrual cycles or using certain medications;
- rebounding from a low blood glucose;
- poor compliance with DMMP;
- no apparent reason; and
- malfunction of insulin pump or infusion set.

SYMPTOMS

Mild Symptoms include:

- Increased thirst;
- Frequent urination;
- Fatigue/sleepiness;
- Increased hunger;
- Loss of concentration;
- Blurred vision; and
- Urine ketones (0-small).

Moderate Symptoms include:

- Sweet smelling breath;
- Dry mouth;
- Nausea;
- Stomach cramps;
- Vomiting; and
- Urine Ketones (Moderate-Large).

Severe Symptoms include:

- Labored breathing;
- Very weak;
- Confused;
- Unconscious; and
- Urine ketones (Moderate-Large).

TREATMENT

The goal in the treatment of hyperglycemia is to lower the blood glucose level to within a student's target range. **Always follow the individual student's DMMP and Hyperglycemia Emergency Action Plan.**

Generally, the action steps for hyperglycemia are as follows.

- Verify status with a blood glucose check as specified in the DMMP.
- Check blood or urine ketones as specified in the DMMP.
- Give extra water and unrestricted access to the restroom and to liquids, as high blood glucose levels can cause increased urination and may lead to dehydration if the student cannot replace fluids.
- Calculate the correction insulin dose needed.
- Administer insulin as specified in the DMMP.
- Recheck blood glucose per DMMP. (Example: Every two hours to determine if it is decreasing to target range).
- Restrict participation in physical activity as specified in the DMMP. However, if the student is not nauseous or vomiting and moderate to large ketones are not present, light physical activity might help to lower the blood glucose level.
- Notify parent/guardian or health care provider as specified in the student's DMMP.

CONSIDERATIONS WHEN USING AN INSULIN PUMP

The concern for a student using an insulin pump with hyperglycemia is a malfunctioning pump and the risk of quickly going into Diabetic Ketoacidosis (DKA).

- Check to see if the pump is connected properly and the infusion site is intact.
 - If a student is using an insulin pump, and it is indicated in the student's DMMP, check to see if the pump is connected properly and functioning by giving a correction bolus through the pump and checking the blood glucose one hour later.
- For infusion site failure:
 - notify parent/guardian for site change and/or;
 - give correction dose of insulin by syringe or pen using insulin dosing prescribed in student's DMMP; and/or

- insert a new infusion set **if allowed by your school board policy** and permission is given by the parent and health care provider.
- If moderate or large ketones are present, restrict physical activity.
- For suspected pump failure:
 - suspend or remove pump;
 - give insulin by syringe or insulin pen; and
 - notify parent/guardian.

KETONE TESTING

Blood Ketone Checking

The blood ketone test is done with a finger stick using a special meter and a test strip, similar to checking the blood glucose. Parents/guardians are responsible for providing a ketone testing meter if indicated in the DMMP.

Urine Ketone Checking

The DMMP will provide authorization and instructions for monitoring the urine for ketones at school. The parent will provide the necessary supplies for testing urine for ketones. When opening a bottle of ketone test strips, the school nurse or trained unlicensed assistive personnel should be sure to note the date and their initials on the bottle. Ketone strips in a bottle typically expire six months after opening.

URINE KETONE CHECKING INSTRUCTIONS

- Gather a clean catch cup for urine and a vial of ketone strips.
- Have the student urinate in a clean cup.
- Use gloves if performed by someone other than the student.
- Dip the ketone test strip in the paper cup containing urine. Shake off excess urine.
- Wait 15-60 seconds, as indicated on the directions printed on the bottle label.
- Read the results at the designated time by comparing the color on the strip to the color chart printed on the label on the bottle. Be careful not to wait longer than recommended to read the result or false results may occur.
- Record results and take action per Diabetes Medical Management Plan (DMMP).

MODULE J: INSULIN DELIVERY

Module J identifies the measures required for the safe delivery of insulin in the school setting. After reviewing the material, the school staff should be able to safely implement the delivery of insulin per the student's Diabetes Medical Management Plan in observation of the local school division policies.

Students with Type 1 diabetes and many students with Type 2 diabetes need to administer or be given insulin at regular times during the school day. Students may need to take insulin prior to meals and/or snacks and may need additional or corrective doses of insulin to treat hyperglycemia as specified in the DMMP.

The DMMP, which will be different for each student, specifies the dosage, delivery system, and schedule for insulin administration. The Individualized Healthcare Plan (IHP) and the student's education plan, based on the DMMP, should specify who will administer prescribed insulin and under what circumstances.

Some students who need insulin during the school day are able to administer it on their own; others will need supervision; and yet others will need someone to administer the insulin for them. The school nurse and/or trained diabetes personnel should assist with insulin administration in accordance with the student's health care plans and education plans.

A diabetes trained health care professional such as the school nurse or a certified diabetes educator should teach, monitor, and supervise trained unlicensed assistive personnel to administer insulin.

New types of insulin and new delivery systems help keep blood glucose levels within the target range. These options, however, require more frequent blood glucose monitoring and more assistance for the student with diabetes.

TYPES OF INSULIN

- **Rapid-acting insulins** take effect quickly, within ten-fifteen minutes. This type of insulin is used primarily to treat high blood sugars, the carbohydrates to be eaten, or to correct an elevated blood glucose level and is referred to as *bolus insulin*. This type of insulin is used in insulin pumps. **Rapid-acting insulins are interchangeable (e.g., Humalog®, Novolog®, Apidra®, Fiasp®, Admelog®)** unless the student is allergic to a certain brand or otherwise indicated on the doctor's orders/DMMP.
- **Regular or short-acting insulins** are similar to rapid-acting insulins, but are to be injected approximately 30 minutes before the start of each meal. They may also be called *bolus insulin*, but when compared to rapid-acting insulin, their peak is delayed and their duration is longer.

- **Intermediate and long-acting insulins** are called **basal** insulins. They are not used to treat acute high blood sugar, but rather during times when the person is not eating, overnight, or between meals.
- **Long-acting insulins** reach the bloodstream several hours after injection and tend to lower glucose levels evenly over a 24-hour period.

BASICS OF INSULIN DOSING

- Doses of insulin are measured in “units.”
- One vial of insulin contains ten milliliters (mls.) which is equivalent to 1,000 units of insulin.
- **One unit of insulin can alter a blood glucose level; therefore, it is imperative that the ordered dosage be EXACT!** (Southall, 2017).
- Insulin syringes come in several sizes with half to one-unit markings. The appropriate syringe should be used based upon the insulin dose.
- Insulin should only be administered from a properly labeled prescription vial from a pharmacy, or a cartridge prefilled insulin pen, or an insulin pump.
- Specific written authorization from the student’s health care prescriber and written parental consent is required for insulin administration.
- Written dosing instructions and consents must be contained in the DMMP. If instructions are unclear, or if the individual calculating insulin dosing is uncertain of measurements, that individual must stop, must not administer the insulin, and must seek immediate assistance from the school nurse, the School Physician or School Nurse Practitioner, the prescriber, or hospital Emergency Department.
- Insulin may not be given unless the individual administering it is certain the dosing is precise and correct. If no one is available to clarify the dosing, the parent should be notified immediately.

INSULIN ADMINISTRATION

The three most common ways to administer are with a syringe, an insulin pen, or an insulin pump. Insulin therapy plans are tailored to the individual student’s insulin needs as well as the family and student’s health literacy and numeracy (i.e., ability to understand the prescribed plan). Two common plans are the basal/bolus insulin plan and the fixed dose insulin therapy plan.

Basal/Bolus Insulin Plan (Adjustable Insulin Therapy)

Most students with Type 1 diabetes use a basal/bolus insulin plan. This type of insulin plan, sometimes referred to as adjustable insulin therapy, reproduces or mimics the way a normally functioning pancreas produces insulin.

- Basal insulin is the long acting or intermediate- acting insulin delivered once or twice a day. This type of insulin is used to control blood glucose levels when a person is not eating, overnight, and between meals.

- Bolus insulin refers to a dose of rapid-acting or short-acting insulin that is given to counter the carbohydrates in a meal or snack and to lower blood glucose levels that are above target.

Fixed Dose Insulin Therapy Plan

Some students may take the same doses of insulin every day with rapid-acting, short-acting, intermediate-acting, or long-acting insulin. This is referred to as fixed dose insulin therapy.

CHARACTERISTICS OF INSULIN

- **Onset** is the length of time before insulin reaches the bloodstream and begins lowering blood glucose levels.
- **Peak** is the time at which insulin is at its maximum strength in terms of lowering blood glucose levels.
- **Duration** is the number of hours during which insulin continues to lower blood glucose levels.

STORAGE OF INSULIN

The FDA provides the following information on insulin storage and effectiveness:

- Recommendations for insulin storage in the refrigerator at approximately 36°F to 46°F. Unopened and stored in this manner, these products maintain potency until the expiration date on the package.
- Insulin products contained in vials or cartridges supplied by the manufacturers (opened or unopened) may be left unrefrigerated at a temperature between 59°F and 86°F for up to 28 days and continue to work.
- Insulin loses some effectiveness when exposed to extreme temperatures. Do not use insulin that has been frozen. Keep insulin away from direct heat and out of direct sunlight.

Vial Storage

- Once the vial is punctured, it is OPEN.
- Once you stick a needle in the vial, it is OPEN.
- OPEN vials can be stored in the refrigerator or at controlled room temperature.
- Insulin kept in the refrigerator should be removed and allowed to reach room temperature before injection.

Pen Storage

- Once used for the first time, insulin pens should not be stored in the refrigerator. Instead, they should be stored at controlled room temperature.
- The number of days you can use the pen will depend on which pen you use. Pens last from 7 to 28 days if stored at room temperature.

Additional Tips for Proper Storage

- Write the date on the insulin vial on the day you open it or start keeping it outside the refrigerator. This will help you remember when to stop using it. Throw the insulin away 28 days after opening or once removed from the refrigerator.
- Inspect the insulin before each use. Look for changes in color or clarity. Look for clumps, solid white particles or crystals in the bottle or pen. Insulin that is clear should always be clear and never look cloudy.

Storage Information for Insulin Pumps

Insulin contained in the infusion set of a pump device (e.g., reservoir, tubing, catheters) may need to be discarded after 48 hours, or per manufacturer's instructions. Insulin contained in the infusion set of a pump device and exposed to temperature exceeding 98.6 °F should be discarded.

The following diabetes care procedures have been adapted from:

- The Virginia Department of Health [*Guidelines for Health Care Procedures in Schools*](#) (2017).
- The ADA's training curriculum [*Diabetes Care Tasks at School: What Key Personnel Need to Know*](#) (2019).

PROCEDURES FOR INSULIN DELIVERY

Guidelines

- Training of unlicensed assistive personnel staff must be done by a registered nurse (preferably a certified diabetes educator) or physician (preferably an endocrinologist).
- Insulin must be administered only in accordance with the orders of a licensed prescriber and accompanied by written parent permission. Specific guidelines must be provided by the primary health care provider for the conditions (blood glucose levels) under which specific units of insulin may be administered.
- Unlicensed assistive personnel may not deviate from the medical regimen written by the prescriber. One exception is if the prescriber gives a verbal phone order to the school nurse, which should be witnessed by another responsible adult, written down by the school nurse in the student's permanent medical record, and followed up with a written order from the prescriber within 24-hours.
- School nurses and unlicensed assistive personnel may not take orders for insulin dosing changes from a parent without pre-arranged sliding scale medical orders.
- Parents provide necessary equipment, supplies, and medications. Students should be encouraged to participate in self-care, as indicated in the DMMP.

Insulin Delivery by Syringe

This injection procedure is for the administration of regular or rapid-acting insulin, not for mixing with other insulin.

Procedure

- Wash hands and assemble equipment to include:
 - vial of insulin;
 - insulin syringe with needle;
 - alcohol prep pad;
 - cotton balls or spot bandage (optional);
 - gloves, if done by anyone other than the student; and
 - sharps container.
- If insulin is cold, warm the vial in the palm of the hand to room temperature. **Injecting cold insulin may cause pain and may affect absorption.**
- Check insulin type/brand for agreement with the prescriber's order. Double check.
- If this is a new bottle of insulin, remove or have the student remove the flat, colored cap. Record the date the bottle is opened and the initials of the person who opened the bottle on the label. **Do not** remove the rubber stopper or the metal band under the cap.
- **Check expiration date** of the vial of insulin. If the bottle was previously opened, also check the date it was opened and follow guidance under "insulin administration" above. If the insulin is past the expiration date, it may not be used.
- Clean the rubber top of the insulin vial with an alcohol wipe, and let dry for a few seconds.
- Remove the cap from the syringe. Point the needle away from you and the student and slowly pull back on the plunger to fill the syringe with air equal to the number of units of insulin needed. Measure twice because a dosing error by misplacing a zero can be devastating. Lift the vial of insulin without touching the rubber top you just cleaned. Carefully plunge the needle into the vial, being cautious not to hit your hand holding the vial with the needle. Keeping the needle below the liquid in the vial, slowly push the plunger to inject air from the syringe into the insulin bottle while keeping the needle with the attached syringe remaining in the bottle. Invert vial and pull plunger back just beyond the number of units desired. While keeping the syringe in an upright position, clear any air by pulling plunger back and tapping the syringe to raise air bubbles to the top. Push plunger slowly to remove the air bubble and to pull the desired amount of units of insulin into the syringe, ensuring that no air bubbles remain. Withdraw the syringe.
- Air bubbles left in the syringe can alter the desired dose.
- For a clean unused needle, slip the needle back into the cap without touching the cap or needle. (Refer to the procedure for One-Handed Needle Recapping in the *Virginia Department of Health Guidelines for HealthCare Procedures in Schools 2017*, (p. 26), if syringes must be recapped).

- Put on gloves, select the site to be used, and prep with alcohol and let dry. If the area is dirty, wash with soap and water and dry. Any subcutaneous tissue can be used for injection sites. The best absorption is in the lower abdomen, followed by the upper, outer arms, tops of the thighs, and lastly the upper areas of the buttocks. Exercise and heat (like the warmth from a heating pad or whirlpool) also hastens absorption of an injected area. Ask the student whether they have a preferred site and listen to the student's guidance.
- Pinch up skin and tissue with one hand. With the other hand, hold the syringe with the eye of the needle pointing upward like a pencil. Dart the needle into the "soft pocket" (area that lies directly in front or behind the pinched up skin) at a 90 degree angle.
- Inject insulin in one to five seconds by pushing steadily on the plunger. Do not aspirate or pull back the plunger.
- Release pinched up skin, count to five, then remove needle while applying gentle pressure at the injection site for ten to fifteen seconds. This will help to prevent leakage from the site. Hold the dirty needle and syringe pointed away from you and the student and consciously avoid accidental needle sticks. Take care to avoid injecting into the muscle, as it will hasten absorption. Do not massage the area as it irritates the tissue and hastens absorption.
 - Continue to point the used needle and syringe away from you and away from the student. Do not recap used needles. When finished with the needle and syringe, carefully dispose of them directly into the used sharps container.
 - **Do not recap used needles.** Recapping a contaminated needle can result in a needle stick injury.
- Document in student log the dose of insulin given, time given, site used, and any reactions or problems noted. If there is a problem injecting, or if the full dose was not given, contact the school nurse coordinator for assistance.

Insulin Delivery by Pen

An insulin pen is an insulin delivery system that generally looks like a large pen, uses an insulin cartridge rather than a vial, and uses disposable needles.

Advantages of using an insulin pen.

- Insulin pens assist in preventing dose errors that may occur with measuring from a vial with a syringe.
- Insulin pens are appropriate when a student is using a single type of insulin.
- They provide a means of delivering an accurate dose in a convenient manner.
- Pens are easy enough for children to use, and are excellent for use at school.

Insulin pens should be handled and stored according to manufacturer's instructions. (Refer to storage of insulin). There are several styles of insulin pens, depending on the manufacturer, but the procedure for use is similar. Always read the directions from the manufacturer, and if you are uncertain of how to use the pen, stop and contact your

supervisor for assistance. Do not attempt to use a pen if there is any question about administering the correct dose.

Some pens use replaceable insulin cartridges. When the cartridge is empty, a new cartridge must be placed in the pen by the student or a trained adult. Other pens do not use replaceable cartridges and the whole pen is disposed of when the cartridge is empty. Most pens use special pen-needles, which can be extremely short and thin. All pens use replaceable needles.

If a pen with insulin suspension is used, such as NPH or pre-mixed insulin, gently shake the pen to be sure the insulin is mixed prior to use. Pens made by different manufacturers are either measured in half or full units. Pen needles should be removed after each use to prevent air from entering the cartridge and to prevent insulin from leaking out.

Figure 7. Insulin Pen: Humalog® Jr.



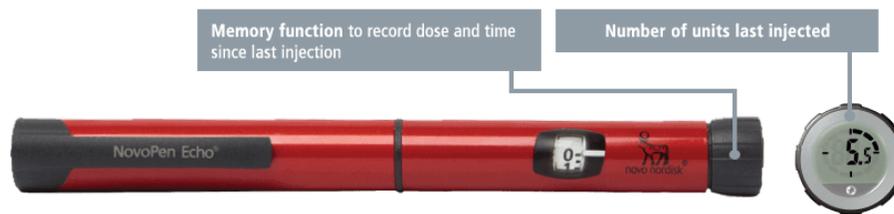
The smallest pen needles are very short and very thin and help minimize the discomfort of injection. Pens need to be held in place for several seconds after the insulin is delivered to make sure that no insulin leaks out. Syringe users who switch to pens should pay close attention to the injection site and test their blood glucose often as they become accustomed to pen injections.

Figure 8. Novolog® Insulin Pen



While pens offer injection convenience, they do not allow mixing of multiple types of insulin. Also, because dosing with a pen involves dialing a mechanical device and not looking at the side of a syringe, insulin users with reduced visual acuity can be assured of accurate dosing with a pen. Should you have a student with a visual impairment, specific pens are available to help enable better visualization.

Figure 9. Novolog® Pro Insulin Pen



Depending on the DMMP, student level of interest and development, involve the student in each of the following steps.

- Obtain a blood glucose reading prior to insulin administration.
- Determine insulin dose with health care provider's orders.
- Wash hands and put on gloves.
- Assemble equipment:
 - Insulin pen device;
 - Pen needle;
 - Alcohol prep pad;
 - Cotton balls or spot bandage (optional);
 - Gloves (if done by anyone other than a student); and
 - Sharps container.
- Check insulin type/brand. This must match the health care provider's written orders. If not, stop and contact the school nurse or prescriber for guidance.
- Check the level of insulin remaining in the insulin cartridge. Cartridges are made for multiple doses. Ensure that enough insulin remains in the cartridge for accurate dosing.
- Attach a new needle. Remove the outer plastic cap and plastic needle. Place the outer cap on a flat surface with the open end facing up. This will assist with needle disposal after insulin is given.
- **Prime the needle by dialing in two (2) units of insulin to perform an "air shot."** Insulin should appear at the needle tip. If it does not, repeat procedure. Changes in temperature can cause air intake. This procedure ensures that any accumulated air will be released, thereby ensuring accurate insulin dosage.
- Dial in prescribed dose. Double-check your dose on the device against the written order.
- Cleanse the skin with alcohol and allow the skin to dry before administering the injection.
- If allowed by the DMMP and permitted by the parent, ask the student if he/she wants to do the injection or to have you do it, or if the student wants to assist you in the process: pinch up the skin at the selected site and dart the needle into the soft pocket at a 90-degree angle. The soft pocket lies directly in front of or in back of the pinched-up skin.
- Push the plunger down and inject insulin at a steady rate.
- Release the pinched-up skin. Count slowly to ten and then remove the needle.
- Grasping the pen with the needle pointed away from you and the student, place the needle into a plastic needle cap that was left upright on a flat surface.

Unscrew the needle tip, avoiding sticking yourself, and carefully discard into a sharps container. Do not lift the cap up with your fingers. Leave the cap on the counter and use the pen to place the needle into the cap to avoid the possibility of a needle stick injury (refer to [Procedure for One-Handed Needle Recapping](#)).

- The needle must be changed after each injection, as leaving the pen needle attached leaves an open passageway into the insulin and contamination may occur.
- Document appropriately in student log.
- If an accidental needle-stick occurs with a contaminated needle, wash the area thoroughly with soap and warm water, allowing bleeding to occur to cleanse the wound. Notify your supervisor immediately in accordance with the school division's Blood-borne Exposure Control Plan.

For further information about how to administer insulin using an insulin pen, refer to the ADA's, [How to Properly Inject Insulin](#).

Insulin Delivery by Pump

Insulin pumps are small, computerized devices that mimic the way the human pancreas works by delivering small doses of short acting insulin continuously (basal rate). The device also is used to deliver variable amounts of insulin when a meal is eaten (bolus) or to correct (lower) an elevated blood glucose level (Aleppo, 2021).

Some pumps look like a pager, and students usually wear it on their waistband, belt, or in their pocket. The pump holds a reservoir of insulin attached to an infusion set that leaves a very small needle or plastic cannula (a tiny, flexible plastic tube) under the skin. Infusion sets are started with a guide needle, then the cannula is left in place and taped with dressing, and the needle is removed. The cannula usually is changed every two to three days or when blood glucose levels remain above the target range, or ketones are present. **Routine site changes are a responsibility of the family and generally are done at home.**

Other pumps look like a pod or a patch. These pumps are attached directly to the skin and a guide needle inserts the cannula under the skin automatically. The student usually wears the pod on his or her abdomen, buttocks, leg, or arm. The pod contains the insulin (there is no tubing). The pod-type pump is controlled by a small hand-held computer device that is kept nearby. This type of insulin pump needs to be changed every two to three days.

Features of Insulin Pumps

- Insulin pumps use rapid-acting insulin.
- Some insulin pumps still require the student to enter the blood glucose value into the pump in order for the pump to calculate the bolus dose.
- Most pumps now receive the blood glucose value directly from the meter.

- Some pumps have the technology to allow communication between the CGM and the pump, enabling the insulin pump to rely on the CGM information to reduce or stop the delivery of insulin if a low glucose level is anticipated.
- Insulin pumps can determine the insulin still active in the body (amount of insulin on board).
- The fewer hands touching the cannula, the lesser the risk for infection. Therefore, the cannula should be changed at home by the family every two or three days.
- Trained unlicensed assistive personnel or the student can disconnect the tube from the set for sports, showering, or any other short activity per the DMMP.

Advantage of Insulin Pumps

- Users are free from multiple daily insulin injections.
- The pump delivers insulin in a way that is similar to what the body does naturally.
- Users may achieve improved blood glucose control.
- Basal insulin delivery can be fine-tuned to the user's needs, allowing for adjustments for the differences in insulin sensitivity that change over the course of 24-hours.
- The pump uses frequent pulses of rapid-acting insulin, allowing for more consistent action on blood glucose than with intermediate or long-acting insulin.
- Users may be able to participate in unplanned physical activity without eating extra food.
- The pump is durable and contains many child safeguards.
- The pump can be pre-programmed with **insulin-to-carbohydrate ratios** and blood glucose correction factors.
- When additional insulin, called a bolus, is needed to balance the carbohydrates in a meal or snack, or when blood glucose levels are high, the pump calculates the bolus dosage after the student enters the number of grams of carbohydrates to be eaten.
- Innovations in pump and sensor technologies are allowing for automation of insulin delivery by the pump.

It is the responsibility of licensed and unlicensed assistive personnel to become familiar with the manufacturer's instructions for the proper and safe operation of a student's specific insulin pump. Unlicensed assistive personnel should be advised during training not to accept responsibility for operation of an insulin pump until they are confident of its operation and of the student's DMMP.

There are several manufacturers who make different models of pumps currently being used for children. All models function based on the same principals but each is designed differently. See below for manufacturer's websites for product information. Each of the sites have detailed and specific information as to how the individual pumps function.

Those trained to administer insulin need to be trained on the individual student's model. The parent is responsible for ensuring that the school has the instruction manual and customer service number for the specific pump that the student is using. The customer-service telephone number may be located on the back of the pump for emergency assistance.

In the DMMP, it should specify where at school the student will keep a set of backup pump supplies and an alternate means of administering insulin in the event of a problem such as pump malfunctions, loosened cannulas, elevated blood glucose above target range, or ketones in the urine (Helping the Student, 2020). Staff should know how to suspend or disconnect the pump and to change the battery.

In accordance with the *Code of Virginia* § [22.0-274.01:1 B](#) a local school board employee who is a registered nurse, licensed practical nurse, or certified nurse aid and who has been trained in the administration of insulin and glucagon **may** assist a student who is diagnosed with diabetes and who carries an insulin pump with the insertion or reinsertion of the pump or any of its parts. Prescriber authorization and parental consent shall be obtained for any such employee to assist with the insertion or reinsertion of the pump or any of its parts. **Nothing in this section shall require any employee to assist with the insertion or reinsertion of the pump or any of its parts.**

Manufacturers of Insulin Pumps

- [Accu-Chek](#)
- [Omnipod®](#)
- [Medtronic](#)
- [Tandem Diabetes Care](#)

CALCULATION OF INSULIN DOSE

The DMMP will specify the meal plan and the method of calculating the insulin dose for an individual student. The school nurse or certified diabetes educator should teach, monitor, and supervise trained diabetes personnel to administer insulin (Helping the Student, 2020).

Most students have a meal plan using a method of carbohydrate counting. There are two methods of meal planning using carb counting: 1) following a consistent carb-intake meal plan and 2) adjusting insulin for changing carb intake.

Method 1: Carb Intake Meal Plan

Students who follow a consistent carb meal plan aim for a set amount of carb grams at each meal and snack and do not adjust their mealtime insulin for the amount of carb intake. Example: 60 grams of carbs at each meal. This method of meal planning is often used by students taking intermediate-acting insulin in the morning or students who receive a preset amount of rapid or short-acting insulin at lunch.

Students who follow a **Fixed Dose Insulin Plan** or consistent carb intake meal plan:

- Need to maintain consistency in the timing and content of meals and snacks. (Eat lunch at the same time each day); and
- May need snacks to achieve a balance with peak times of insulin and physical activity.

Method 2: Adjusting Insulin for Changing Carb Intake or Basal/Bolus Insulin Plan

Students who use multiple daily injections or an insulin pump usually use this method of meal planning. This method requires adjusting insulin doses to the amount of carbs the student will consume by using an **insulin-to-carb ratio** and an **insulin correction factor (sometimes called the insulin sensitivity factor (ISF))** (Helping the Student, 2020, Kennedy, 2021).

Carbohydrate Ratio:

Specifies how much carbohydrate that each one unit of insulin (rapid or short-acting insulin) will match.

- Varies from student to student; and
- Is specified in the DMMP (for example, a common ratio is 1:10);
 - Usually stated as one unit per x number grams of carbohydrate.
 - Calculated for a meal that contains 60 grams of carbohydrate; if the ratio is 1:10, then, take the 60 grams divided by ten to get six units of insulin for the correct dose.

Insulin Correction Factor or Insulin Sensitivity Factor:

The amount of insulin to correct a blood glucose level above the student's target range must be calculated. Correction doses are calculated by subtracting the target blood glucose from the actual (high) blood glucose. Then the difference is divided by a correction factor to determine how many units of insulin are needed to lower blood glucose to target range.

For example, consider a student whose blood glucose level is 150 and the target is 100. If the correction factor is 50, this means one unit of insulin would be given as a correction dose to correct for high blood glucose. This information should be addressed in each student's DMMP.

Some students may use a blood glucose meter or insulin pump that performs bolus calculations automatically. Insulin-to-carb ratios and insulin correction formulas are pre-programmed into the device and take into consideration the insulin still active in the body or "**insulin on board.**"

For some students dosing at mealtime may include both a carbohydrate ratio dose and a correction dose for blood glucose that is above or below the target range. Students, whose dosing accounts for both carbohydrates and blood glucose are more likely to need assistance from school staff.

In this case: The Carbohydrate Dose + Correction Dose = Total dose to be administered.

Examples

Step 1. Calculate an insulin dose for food:

- Add up the grams of carbohydrate in the foods to be eaten.
- Divide the total grams of carb by the insulin-to-carb ratio.

$$\frac{\text{Total Grams of Carbohydrate to be eaten}}{\text{Insulin-to-Carb Ratio}}$$

Example: Say that a student is planning to eat 45 grams of carbohydrate and the insulin-to-carb ratio is one unit of insulin for every 15 grams of carbohydrate eaten.

To figure out how much insulin to give, divide 45 by 15.

$$\frac{\underline{45 \text{ Grams of Carbohydrate}}}{15} = \text{Three units of insulin is needed for this amount of carbohydrate}$$

Step 2. How to use the correction factor (ISF) to reach the target blood glucose:

- Subtract the target blood glucose from the current blood glucose.
- Divide the difference by the correction factor.

$$\frac{\underline{\text{Current Blood Glucose} - \text{Target Blood Glucose}}}{\text{Correction Factor}}$$

Example: The student's pre-meal blood glucose is 190 mg/dl, and the target blood glucose is 120 mg/dl. The insulin correction factor is 35.

$$\frac{\underline{190 \text{ mg/dl} - 120 \text{ mg/dl}}}{35} = \text{Two units of insulin will bring blood glucose of 190 mg/dl down to 120 mg/dl.}$$

Step 3. Add the insulin needed for carbs to the insulin to correct high blood glucose for the total dose. Example from Steps 1 and 2:

$$\begin{array}{r} \text{Three units for food (carbs)} \\ + \text{Two units to correct high blood glucose} \\ \hline \text{Total Dose} = \quad \text{Five units} \end{array}$$

For more information on carb counting, refer to the [Colorado Kids with Diabetes](#), insulin to carbs ratio charts.

MODULE K: DISPOSAL OF MEDICAL SUPPLIES

After completion of Module K, participants will be able to demonstrate the safe disposal of diabetic medical supplies. All school staff and students who have permission from a parent and healthcare provider to self-care will follow the proper disposal procedures for medical supplies as outlined in this module and per their local school division policy.

Used needles, syringes, and lancets must be disposed of in a properly labeled biohazard sharps container as they are used. Each local school division will have policies and protocols regarding disposal of medications and syringes.

School divisions should have a protocol for notifying parents about the need to pick up unused medication(s) and/or supplies. Parents should pick up unused medication within one week of the expiration date or by the last day of school. Parents should be notified and given sufficient time to pick up remaining medication, according to school policy or protocols. Medication remaining after the designated date for pick up shall be destroyed. Therefore, parents should be advised in advance of the division's protocol for destroying unclaimed medication(s)/supplies. For more information, refer to *VDOE Medication Administration School Nurse's Guide: A Training Manual for Unlicensed Public School Employees 2020*.

Medications are costly and every effort should be made to contact a parent to arrange for their pick-up of non-expired diabetes supplies. However, supplies that are not picked up should be destroyed on the last student day. Disposal should be in accordance with current state and federal environmental and health care standards and district protocols with appropriate witnessing and documentation. The Food and Drug Administration published helpful information on the disposal of [When and How to Dispose of Unused Medications](#).

MODULE L: DOCUMENTATION

Upon completion of Module L, participants will be able to document the care and administration of medication within the student record, conform to privacy guidelines, and observe the Library of Virginia guidelines for secure records retention.

All care given to a student with diabetes must be recorded in the student's cumulative medical record. Documentation is the legal record that medication has been ordered, parents have given permission to administer it, and that the school staff has given the medication and/or performed procedures or essential interventions. Documentation is commonly considered the "sixth right" of medication administration.

Student health records are education records, and they are protected under the *Family Education Rights and Privacy Act (FERPA)*. However, for communication by the school to occur with a medical provider, the medical provider cannot share or exchange information without a *Health Insurance Portability and Accountability Act (HIPAA)* compliant release. Schools may create one form to suit both purposes.

Health records should be securely maintained to ensure student privacy, per school board policy. Forms for documenting the administration of medications and treatments vary by school district. Whatever forms are used, the record must be clear, concise, and complete. Furthermore, if all essential information is documented by a prescriber as required, but is on a different form, schools should consider accepting the document, since it is the information rather than the form that matters. Student health records should be maintained in accordance with the appropriate [Records Retention and Disposition Schedule\(s\) from the Library of Virginia](#).

MODULE M: PLANNING FOR UNEXPECTED EVENTS

Module M emphasizes the need for trained school personnel to prepare for field trips or other school activities and unexpected events such as natural disasters or lockdown procedures. After reviewing this module, school staff and students will be able to develop strategies to mitigate unexpected events and emergency situations.

EMERGENCY SUPPLIES

Parents/guardians are strongly encouraged to provide an emergency supply kit for unexpected events, or unusual situations, if students need to stay at school. This kit should contain enough supplies for at least 72-hours to carry out the medical orders in the DMMP (Helping the Student, 2020, p. 36). The emergency supply kit can include:

- Blood glucose meter, testing strips, lancets, and batteries for the meter;
- Urine and/or blood ketone test strips and meter;
- Insulin, syringes, and/or insulin pens and supplies;
- Insulin pump supplies;
- Other medications;
- Antiseptic wipes or wet wipes;
- Quick-acting source of glucose;
- Water sufficient for 72-hours;
- Carbohydrates containing snacks, such as whole grain crackers and dried fruit;
- Hypoglycemia treatment supplies (enough for three episodes): quick-acting glucose and carbohydrate snacks; and
- Glucagon emergency kit.

SPECIAL EVENTS AND FIELD TRIPS

Students with disabilities, which include students who have special healthcare needs such as diabetes, must be given an equal opportunity to participate in academic, nonacademic, and extracurricular activities. This includes school-sponsored trips such as extracurricular activities, field trips, intramural athletic events, and interscholastic athletic events. (Field Trip Considerations, 2020, NASN Trips, 2019).

School-sponsored trips are offered to complement and enhance the educational experience for students. A trip may be as simple as a local excursion for just a few hours or as complicated as a trip for several days to a different city, state, or country. While schools may invite the parents/guardians of a student with special healthcare needs to accompany the student on the trip, school officials cannot require that a parent/guardian of a child with special healthcare needs attend if parents of students without special healthcare needs are not required to accompany their children (NASN Trips 2019).

The school nurse or trained diabetes personnel should accompany the student with diabetes on field trips as well as be available at school sponsored extracurricular activities. With proper planning, students with diabetes can participate fully in all school-related activities (Helping the Student, 2020).

ADDITIONAL INFORMATION

- Have a discussion with parents/guardians as to what the plan may be for when high carbohydrate foods are brought into the classroom for parties and special events.
 - The student may want to take the food home.
 - The parent/guardian may want to provide a substitute.
- For field trips, notify parent/guardian in advance of a planned trip.
- Notify the food service manager in time for them to prepare a modified bag lunch if necessary.
- Assess the trip plans, including transportation methods, student's dietary issues and needs, accompanying staff, layout/structure of the planned visitation site(s), duration of the trip, and proximity/access to emergency medical care.
- Be sure the authorities of the venue you are visiting are aware of the medical supplies the student will require and that water and bathrooms are easily accessible.
- Consult the student's DMMP for specific instructions regarding these activities.

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DIABETES TRAINING RESOURCES

The [American Diabetes Association, Safe at School Program](#) provides information to parents, students, and school personnel about safe diabetes management in the school setting.

[Children's Hospital of Richmond - Endocrinology Resources](#) is a webpage of resources for schools, parents, and community stakeholder.

[Children's Hospital of Richmond Diabetes Handbook](#) provides information and resources on Diabetes and includes a carbohydrate-counting worksheet.

[Colorado Kids with Diabetes](#) contains training materials for school nurses used with permission from Leah Wycoff, Colorado Kids with Diabetes. This webpage provides a plethora of training content, technical assistance, and school nursing specific information.

- [Diabetes Tiered Training Model](#)
- [600 Tier Training \(2020\)](#)
- [Diabetes Skills Checklist](#)
- [Diabetes Tier 1 and Tier 2 Training \(Individual Student\)](#)
- [Diabetes Tier 1 and Tier 2 Training \(Multiple Students\)](#)
- [American Diabetes Association, School Nurse Insulin Pump Checklist](#)
- [Diabetes, IHP Care Plans](#)
- [Diabetes Handouts for School Staff and Parents](#)
- [Diabetes and the Adolescent Population](#)

[Virginia Diabetes Council \(VDC\), Diabetes in Schools](#) provides student specific information and resources on Diabetes Medical Management Plan (DMMP), DMMP FAQ, supplemental forms, and training links. This includes information regarding the Lions Empowering and Assisting Regional Nurses in School (LEARNS) pilot program.

- [Diabetes Medical Management Plan \(DMMP\)](#)
- [School Form: DMMP Memo](#)
- [DMMP, Supplemental Form](#)
- [DMMP, FAQ's](#)
- [Quick Links to Diabetes Technical Training](#)
- [Continuous Glucose Monitoring \(CGM\) Position Statement](#)
- [American Diabetes Association \(ADA\), 504 Plan Information and Resources](#)
- [US Department of Education, Frequently Asked Questions about Section 504 Plans](#)

GLOSSARY

Acanthosis nigricans- a condition in which the skin around the neck, armpits, or groin looks dark, thick, and velvety and is a physical sign of insulin resistance.

Autoimmune disorder- a malfunction of the body's immune system that causes the body to attack its own tissues.

Basal/bolus insulin- involves taking a longer acting form of insulin to keep blood glucose levels stable through periods of fasting and separate injections of shorter acting insulin to prevent rises in blood glucose levels resulting from meals.

Blood Glucose Level- the amount of glucose or sugar in the blood.

Bolus- a dose of rapid-acting or short-acting insulin given to cover the carbohydrate in a meal or snack and to lower blood glucose levels that are above target.

Celiac disease- some students with Type 1 diabetes may also have celiac disease. When people with celiac disease eat gluten (a protein found in wheat, rye and barley), their body mounts an immune response that attacks the small intestine.

Consistent Carbohydrate meal plan- a set amount of carbohydrates is recommended for each meal. The insulin taken may be an intermediate acting insulin or a preset amount of rapid or short acting insulin.

Continuous Glucose Monitor (CGM)- a device that records blood glucose levels throughout the day. The CGM works through a sensor inserted under the skin that measures interstitial blood glucose (the blood glucose found in the fluid between the cells) at regular intervals.

Delegation- the transference to a competent licensed or unlicensed individual the authority to perform a selected task or activity in a selected situation by a nurse qualified by licensure and experience to perform the task or activity.

Diabetic Ketoacidosis (DKA)- severe, out-of-control high blood glucose levels that need emergency treatment. DKA happens when blood glucose levels get too high or insulin levels are far less than the body needs. This may happen because of illness or taking too little insulin. The body starts using stored fat for energy and ketone bodies and acids build up in the blood. The signs include nausea and vomiting, stomach pain, deep, rapid breathing, flushed face, rapid weak pulse, dry skin, and a fruity breath odor. Fluids and insulin must be given quickly since ketoacidosis can lead to coma and even death. DKA is considered a life-threatening emergency that requires transportation to a medical center.

Direct supervision- means the supervisor is on the premises but not necessarily immediately physically present where the tasks and activities are being performed. Immediate access by phone until direct contact can be established is implied.

Carbohydrates or Carbs- one of the three sources of energy in food for the body. Carbohydrates are mainly sugars and starches that the body breaks down into glucose. Foods that contain carbohydrates raise the blood glucose levels. These foods include breads, crackers, and cereals; pasta, rice, and grains; vegetables, milk and yogurt; fruit, juice, and sweetened sodas, table sugar, honey, syrup, molasses, cakes, pies, and cookies.

Carbohydrate Counting- the method of calculating the number of grams of carbohydrates in the food the student eats. In conventional insulin therapy when used in its simplest form, this is a method of maintaining consistency in carbohydrate intake from day-to-day. When this is used in intensive therapy, it serves as the basis for determining the amount of insulin to administer for any given meal.

Carb Ratio- the amount of insulin given to a specific amount of carbs that are eaten.

Glucagon- a hormone produced in the pancreas that raises the level of glucose in the blood. Available as a life-saving medication, glucagon injection may be given to a child with diabetes in an emergency to raise extremely low blood glucose levels if a student is unable to intake oral glucose sources.

Extended Bolus- at times, it may be recommended to administer a dose of insulin via the pump over a period-of-time. This will be indicated in the DMMP by the healthcare provider.

Hyperglycemia- a condition in which blood glucose levels are elevated above the DMMP guidance, requiring decisive intervention.

Hypoglycemia- a condition in which blood glucose levels are below the DMMP guidance, requiring decisive intervention. Hypoglycemia is considered a life-threatening condition.

Individualized HealthCare Plan- a nursing care plan developed by the school nurse describing the way health related services would be provided to specific students in the school setting. It can be a stand-alone care plan or an attachment to the *Diabetes Medical Management Plan*, which is provided by the physician and parent/guardian. The attachment should specify the unlicensed assistive person who will be delegated and trained to provide selected tasks in the school setting regarding blood glucose monitoring and insulin administration and to follow the Emergency Action Plan in the event of an emergency. It should also include any other information not in the Information Sheet for the School Management of Diabetes Mellitus that the school nurse identified during the care planning process with parents and school personnel.

Insulin- a hormone secreted by the islet cells in the pancreas that allows the body's cells to absorb glucose for energy. It is used as a medication when the body does not make enough insulin to maintain proper blood glucose levels.

Insulin resistance- occurs when a person's body does not recognize insulin or does not use the insulin properly.

Insulin sensitivity- is also referred to as a correction factor and is the amount of insulin the student needs to lower the blood glucose into the target range.

Ketones- are produced when the body burns fat for energy or fuel. They are also produced when you lose weight or if there is not enough insulin to help your body use sugar for energy.

Mg/dL-Milligrams per deciliter- a unit of measurement used in blood glucose monitoring to describe how much glucose is in a specific amount of blood.

Non-Medical Assistive Personnel- any individual who has been trained and designated to perform health-related services for students while they are in school, but who are not receiving compensation for nursing or medical services. May also be referred to as an unlicensed assistive personnel (UAP).

Nursing Care Plan- refer to "Individualized Health Care Plan (IHCP)."

School Nurse- a professional nurse registered and licensed to practice in Virginia who is employed by the county health department, local school district, or contracted by the county health department or local school district from a community-based agency. The school nurse may be assigned to one or more schools and provides leadership and services consistent with the *Virginia Nurse Practice Act* and the Virginia Department of Education and Health School Health Services Program. Ideally, the school nurse should have a minimum of a Bachelor of Science degree, National School Nurse Certification, with experience and additional education in pediatric assessment and intervention of the school-age child.

Sliding Scale- a medical order indicating a range of blood glucose values and the amount of insulin to be administered for that blood glucose level. Readings that are above or below the sliding scale readings require immediate and decisive action by the supervising adult by conferring with the DMMP and Emergency Action Plan for hypoglycemia or hyperglycemia, and/or phone conference with the prescriber.

Supervision of School Health Staff-indirect Supervision- is the provision of guidance by a qualified nurse and periodic inspection by the nurse for the accomplishment of a nursing task or activity provided by unlicensed assistive personnel. The nurse must be qualified and legally entitled to perform such a task or activity. **Direct Supervision** means the supervisor is on the premises, but not necessarily immediately physically

present where the tasks and activities are being performed. Immediate access by phone until direct contact can be established is implied.

Target range- determined by the health care provider and indicated in the DMMP stating the range of safe blood glucose levels for an individual student.

APPENDIX A: GUIDELINES FOR TRAINING OF PUBLIC SCHOOL EMPLOYEES IN THE ADMINISTRATION OF INSULIN AND GLUCAGON

AUTHORIZATION

Code of Virginia. Chapter- 570 of the 1999 Acts of the Assembly, An Act to amend and reenact §§ 8.01-225, 22.1-274, 22.1-275.1, 54.1-2901, 54.1-3001, 54.1-3005, and 54.1-3408 of the *Code of Virginia*, relating to care of public school students diagnosed with diabetes.

TRAINING GUIDELINES

Parameters of Training

- Qualifications of instructional personnel. The trainer must be:
 - A registered nurse or licensed physician with recent training or experience in the management of diabetes mellitus in children; and
 - Trained in relevant sections of law and regulations, such as *Individual with Disabilities Education Act* (IDEA) and *Occupational Safety and Health Act* (OSHA).
- The course shall continue until competency is demonstrated, but shall not be less than four hours.
- Retraining shall be completed at least yearly and last not less than one hour.
- Training shall be documented and includes a skills checklist, instructor's name, trainee's name, date of training, and documentation of competency of trainee to administer.

CONTENT OF THE TRAINING CURRICULUM

- The need to have authorization for treatment initially received and updated annually from the following:
 - The student's parent or guardian; and
 - The treating physician, who may further authorize the parent or guardian to alter dosages as necessary.
- The requirement for an individualized healthcare plan for each student to be initially prepare and updated annually.
- Rights and responsibilities of the student, the physician, the parent or guardian, the administrator, and the trainee which are consistent with existing laws and policies of the local school board and with relevant state and federal laws to include, but not be limited to the following:
 - *Individual with Disabilities Education Act* (IDEA);
 - *Section 504 of the Rehabilitation Act*;
 - *Occupational Safety and Health Act* (OSHA); and
 - *The Drug Control Act* (Chapter 34 of Title 54.1 of the *Code of Virginia*).

Overview of Diabetes Mellitus

- Definition
- Types of diabetes

Principles of Medication Administration

- Right student
- Right medication
- Right dose
- Right route
- Right time

Therapeutic Management of Diabetes

- Nutrition
- Exercise
- Medication
- Support of independence
 - Support the student's developing independence through assisting with self-care
 - Support the student's healthy response to diabetes

Monitoring of Student

- Using insulin pump
- Testing blood glucose
- Testing of urine

Insulin Administration

- Proper storage of insulin and medications
- Administration only from a properly labeled prescription vial from a pharmacy
- Essential techniques of administration

Hyperglycemia

- Prevention
- Recognition
- Treatment

Hypoglycemia

- Prevention
- Recognition
- Treatment, including administration of glucagon

Storage and disposal of medical supplies

- Standard precautions
- Security of medication and syringes
- Expiration date of medication

Documentation to Maintain and Include

- Signed authorizations, updated annually, from the student's parent or guardian and from the treating physician.
- The individualized healthcare plan, updated annually, for each student
- Medication administration that is signed and consistent with required procedures.
- Description of any complications.

Emergency Plan

- Existing resources in the community, such as organizations and written materials.

APPENDIX B: FEDERAL LAW AND DIABETES

THE INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA)

The United States Congress, in 1975, passed Public Law 94-142, *The Education for All Handicapped Children Act*. This legislation is now referred to as [Individuals with Disabilities Education Act](#) or IDEA ensuring services to children with disabilities throughout the nation. IDEA governs how states and public agencies provide early intervention, special education, and related services to more than 6.5 million eligible infants, toddlers, children, and youth with disabilities. Infants and toddlers with disabilities (birth-two) and their families receive early intervention services under IDEA Part C. Children and youth (ages three-21) receive special education and related services under IDEA Part B.

The basic rights guaranteed to students with disabilities under IDEA include the following.

- A free appropriate public education for all children.
- An education in the least restrictive environment based on the child's needs.
- An assessment of needs that is racially and culturally unbiased and is given in the child's native language or mode of communication.
- An individualized education program (IEP) prepared by a team of professionals that includes parents.
- Due process and a procedure for complaints to ensure the rights of the individual.

In 1986, 1990, 1991, 1997, and 2004, Public Law 94-142 was amended: however, the basic rights of children with disabilities did not change. These rights continue to provide protection against discrimination for children with disabilities, including those with diabetes.

[IDEA Regulations](#) define "disability." The definition includes a category for chronic or acute health problems that limit the individual's "alertness with respect to the educational environment" (U.S. Department of Education, n.d.). This category is called "other health impairment" (OHI). Diabetes, as well as other health conditions such as asthma and epilepsy, is included in the examples. [Individualized Education Program Forms and Resources](#) for the Commonwealth of Virginia are available on the VDOE webpage.

SECTION 504 OF THE REHABILITATION ACT OF 1973

Section 504 of the Rehabilitation Act of 1973 protects individuals with disabilities against discrimination because of their disability, in any program or activity receiving federal financial assistance, including public schools (U.S. Department of Education, 2010). Students with disabilities have the right to "a free and appropriate public education" (FAPE), regardless of the nature or severity of the person's disability. FAPE includes the provision of educational services to the disabled student as adequately as the nondisabled students' needs are met. This protection includes the right to the

opportunity to participate fully in school activities: academic, nonacademic, and extracurricular.

In order to provide for the needs of a student with disabilities while at school, parents and school officials may develop a Section 504 Plan. In the case of a student whose disability is diabetes, a [Section 504 Plan](#) would outline the diabetes care and/or assistance the student needs in order to access the program of learning. Samples of accommodations might include such things as providing for the administration of insulin or glucagon throughout the school, on the school bus, or at school sponsored activities, allowing the student free access to food or drink or assisting the student with blood glucose checks.

THE AMERICANS WITH DISABILITIES ACT

The *Americans with Disabilities Act*, Title II “requires that state and local governments give people with disabilities an equal opportunity to benefit from all of their programs, services, and activities (e.g., public education, employment, transportation, recreation, health care, social services, courts, voting, and town meetings) (U.S. Department of Justice, 2005). This law prohibits all schools, except those run by religious institutions, from discriminating against students with disabilities.

This law states that all students should have equal opportunity to participate in school-sponsored activities, including field trips and after school events. It states that public schools should make reasonable accommodations for a student with diabetes. Accommodations are to be specified in the education plan and services may include:

- Assuring that there are staff members trained in checking blood glucose levels, recognizing and treating hypoglycemia and hyperglycemia, and administering insulin and/or glucagon;
- Allowing students to monitor blood glucose levels in the classroom and other locations and to treat hypoglycemia and hyperglycemia promptly;
- Providing appropriate supervision to ensure student participation in sports, extra-curricular activities, and field trips;
- Accessing restroom facilities and drinking water as needed; and
- Permitting absences for medical appointments and extra sick days when necessary.

More information on the [Americans with Disabilities Act](#) may be accessed online.

APPENDIX C: CODE OF VIRGINIA REFERENCES PERTAINING TO THE ADMINISTRATION OF INSULIN AND GLUCAGON IN THE SCHOOL SETTING

The *Code of Virginia* establishes the legal basis for diabetes management and training for personnel in the school setting. Specific code references may be accessed online, utilizing the Virginia General Assembly [Legislative Information System](#).

LIABILITY CODE REFERENCES

Code of Virginia § [8.01-225](#). (A) (9) - Persons rendering emergency care exempt from liability.

Code of Virginia references for [School Health Services § 22.1-274](#).

Code of Virginia § [22.1-274\(D\)](#) - Ability of school board employees to refuse training in the administration of insulin and glucagon.

Code of Virginia § [22.1-274\(E\)](#) - Ensures that in school buildings of ten or more instructional and administrative employees there are at least two or more employees trained in administration of insulin and glucagon if there is a student with diabetes in attendance.

Code of Virginia § [22.1-274.01:1](#) - Allows students who are diagnosed with diabetes with prior parental consent and approval from the prescriber to carry and use essential supplies in reasonable quantity to manage routine self-care, as well as emergency treatment of hypoglycemia or hyperglycemia, and to self-test and treat as needed on a school bus, school property, or at a school sponsored activity.

Code of Virginia § [22.1-275.1](#) - Outlines participation of school health advisory boards in developing procedures relating to children with acute or chronic conditions.

DEPARTMENT OF HEALTH PROFESSIONS CODE REFERENCES

Code of Virginia § [54.1-2901](#) - Exceptions and exemptions.

Code of Virginia § [54.1-3001](#)(9) - Exemptions; Exempts any employee when assisting with insulin and glucagon administration.

Code of Virginia § [54.1-3005](#) - Requires the Board of Nursing to develop and revise as necessary, in coordination with the Boards of Medicine and Education, guidelines for training school employees in the administration of insulin and glucagon.

Code of Virginia § [54.1-3408](#) - Professional use by practitioners.

APPENDIX D: RECOMMENDED DIABETES SUPPLIES

Parents are responsible for providing and maintaining all supplies and equipment necessary for implementing the student's health and education plans (Diabetes Care in the School Setting: A Position Statement of the American Diabetes Association, 2015).

Typical supplies might include:

Insulin

- Insulin and insulin administration supplies:
 - Insulin bottle and/or pen with cartridges;
 - Insulin syringes/pen needles; and
 - Alcohol wipes/antiseptic wipes (optional).
- Pump supplies including:
 - Equipment needed to change reservoir and infusion set, prep wipes, manufacturer's operating instructions, and extra batteries.
- Blood Glucose Monitoring Supplies:
 - Blood glucose meter and manufacturer's instructions;
 - Test strips (with code information, if needed);
 - Finger-sticking device;
 - Lancets;
 - Antiseptic wipes/cotton balls;
 - Logbook to record blood sugar and amounts of insulin;
 - Protective covering (e.g., plastic wrap) as needed;
 - Control solution; and
 - Extra tape for securing CGM.

Food

- Snack foods; and
- Choices for physical activity-15 grams carbohydrate:
 - one-four ounce juice box;
 - one cup Gatorade;
 - one sliced orange or apple;
 - one small box raisins;
 - six saltines;
 - one cup light yogurt; and
 - three-fourth cup dry cereal.
- Choices for Physical activity-30 grams carbohydrate:
 - one cereal bar;
 - one eight-ounce juice box;
 - two slices bread; and
 - one small bagel.
- Choices for Physical activity 45-50 grams carbohydrate plus protein:
 - one sports nutrition bar; and

- one-package (six) cheese or peanut butter sandwich crackers plus four oz. juice.
- Protein Sources:
 - peanut butter;
 - sliced or string cheese;
 - lunch meat;
 - egg; and
 - peanuts, walnuts, or almonds.

Low blood sugar (hypoglycemia) supplies

- Quick-acting glucose products:
 - Three-four glucose tablets;
 - 15 grams glucose gel;
 - four oz. regular soda;
 - four oz. juice (unsweetened);
 - three tsp. sugar in water; and
 - three-tsp. jelly, syrup, or honey.
- Glucagon emergency kit

APPENDIX E: RECOMMENDED QUALIFICATIONS FOR THE UNLICENSED ASSISTIVE PERSONNEL (UAP)

Education recommended includes:

- High school diploma or equivalent or higher;
- Ability to read English;
- First aid and CPR certified;
- Office management skills; and
- Other pre-employment training determined by the school district.

Personal attributes include:

- Reports to work as scheduled;
- Understands and follows school policies and guidelines;
- Understands and follows all delegated care tasks;
- Willing to assume responsibility for the assigned tasks;
- Works within UAP job description;
- Adaptable to various school situations; and
- Possesses common sense.

Interpersonal attributes include:

- Genuine liking of children and ability to work with them;
- Able to establish rapport with students, families, and school personnel;
- Maintains confidentiality of information;
- Communicates clearly - written and verbal;
- Willing to be supervised by the school nurse; and
- Introduces self as health care assistant (not the nurse).

Emergency effectiveness includes:

- Stays calm when the unexpected occurs;
- Demonstrates good judgment when unexpected problems arise;
- Knows when to call emergency medical services and/or the school nurse; and
- Comfortable dealing with medical concerns and shows confidence and skill level needed for the tasks.